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features in this issue...

Report of the 54th Annual Meeting, United States Livestock Sanitary Association (Abstracts and notes of papers and committee reports)

Surital Sodium: A New Agent for Intravenous Use

Aureomycin in the Treatment of Strangles

(Complete Index on Page VIII)

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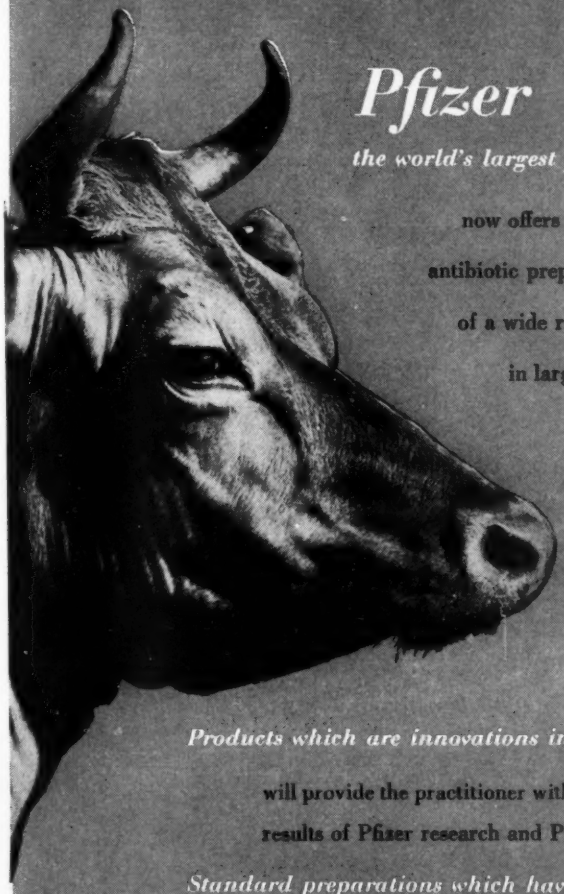

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Report Of The Fifty-fourth Annual Meeting, U. S. Livestock Sanitary Association, Phoenix, Arizona

FROM the organization of the United States Livestock Sanitary Association (then called Interstate Livestock Sanitary Association) in 1897, to the annual meeting in 1908, meetings were held in various parts of the country. From 1909 to 1946, they were held in Chicago. Continuing the practice of recent years the 54th annual meeting was held in Phoenix, Ariz., November 1-3. Kansas City was selected for the 1951 meeting and Atlantic City was tentatively selected for the 56th annual meeting in 1952.

The president, Dr. C. P. Bishop, Harrisburg, Pa., was unable to attend the meeting, which was called to order and presided over throughout by the first vice-president, Mr. F. E. Mollin, Denver, Colo.

Address of Welcome

A feature of the opening session was an address of welcome by Governor Dan E. Garvey of Arizona. Among other things, he counseled the visitors not to judge the capacity of Arizona to produce cattle and sheep from the desert view they had from the railway trains, and assured them there were many irrigated valleys in the state which enabled Arizona to produce a great deal of beef, mutton, and wool. At that, Arizona has but one cow per 500 acres of land. There is no tuberculosis and no brucellosis among Arizona cattle.

A motion picture shown by Dr. F. G. McMahon, state veterinarian of Arizona, supported the governor's description of the state as an important cattle raising area. Many fine herds of Aberdeen Angus and Shorthorn cattle and an overwhelming number of Herefords were shown; all in pastures of grass or alfalfa knee-high to the sleek animals.

The history of Arizona as depicted in the motion picture makes states in the Ohio River and Mississippi River valleys seem new indeed. The first white settlers of Arizona were a group of 500 civilians and soldiers from Mexico, led by Coronado, who located there in 1540. Disappointed by not finding the "seven cities of Cibola," the settlement was abandoned after two years, the pioneers returning to Mexico, and for 158 years the Indians again held undisputed sway over the territory that was to become Arizona.

In 1700, a party of 700, led by Father San Bernardino, located in Arizona. Their principal industries for a century and a quarter were cattle raising, sheep raising and mining precious metals.

Mr. F. E. Mollin, Denver, Colo., Secretary, American National Live Stock Association, was selected as president of the U.S.L.S.A.

In 1828, the Apaches made war on the thriving colony and all but a few settlers who escaped into Mexico were slain. The cattle herds (Andalusian) ranged wild for 50 years.

In 1872, the territory was resettled by whites from Mexico, who brought with them the cattle which later came to be called Texas Longhorns. In 1882, 60 Hereford bulls were imported and the immense cattle industry of Arizona was on the march. Still later, Brahman (Zebu) bulls were imported and they, with Aberdeen Angus and Shorthorn, have come to share a portion of the popularity of the Herefords, which consistently win in stock shows at Denver, Fort Worth, Kansas City, and Chicago.

But Apaches have not been the only enemy of cattle raising in Arizona. Before the days of irrigation, drouths took a terrific toll; some

years causing the loss of 50% and even 75% of all the cattle in the state.

Secretary-Treasurer's Annual Report

The secretary-treasurer's report indicated his office has been a busy one during the year. Eighteen hundred copies of the 255-page, 50th Annual Report were published and all were sold by August 1. The first annual report of

Dr. R. A. Hendershott

the Association (1897) contained but 26 pages and only 100 copies were printed. Incidentally, the secretary will pay $5. per copy for any copies of the first four annual reports sent to him.

He also asked any who have extra copies of reports for years prior to 1924, or have copies they do not care to keep, to donate them to the library of the Association.

There are 768 individual members of the Association and 53 official memberships (commissions, boards, bureaus, etc.). Dues received from individual members totaled $2,306. and from official memberships, $2,650. Receipts from the sale of publications and other sources raised the income of the Association for the year to $19,550.46, including $207. interest on bonds. Expenditures were $21,350.

The secretary's report dealt briefly with the inertia the Association has experienced in endeavoring to have instituted official measures for the collection and publication of veterinary vital statistics; stating that although the United States leads the world in the size of appropriations for control of livestock diseases, it trails all but the backward nations in the information it possesses as to the location and incidence of animal disease. "Failure to report morbidity and mortality of farm animals rests squarely on the shoulders of veterinary practitioners. This failure is a brake on the advance of veterinary science, and is in contravention of paragraph VI of the veterinary code of ethics."

Memorial Service

Conducting the usual memorial service for the committee on necrology, Dr. Hugh Curry, state veterinarian of Missouri, reported that the Association had lost eight members by death since the meeting in Columbus one year ago. Among them:

Dr. Ward Giltner, former dean of the School of Veterinary Medicine, Michigan State College and during the 1920's and 1930's a leader in the discussion of bovine brucellosis at annual meetings of the Association.

Mr. J. J. Ferguson, Swift and Company, secretary of the Association 1910 to 1916 inclusive.

Dr. John S. Koen, BAI, who had long been active in the affairs of the Association, and during the war and subsequently chairman of the Committee on Meat and Milk Hygiene. Doctor Koen died of pneumonia at Sullivan, Ill., October 4. He had been invalided the past two years as a result of a severe attack of cerebral apoplexy.

Dr. Lawrence Frederick, Chief Veterinarian, Swift and Company. Doctor Frederick succumbed to a heart involvement after an illness of approximately one year. He had long been active in the Association.

Dr. John Arnold, president of the Arnold Laboratories, Newcastle, Ind., was killed in a crash of his private plane near Greencastle, Ind.

Recognition of Former Presidents

A new ceremony at this meeting was the presentation of keys to former presidents of the Association. Six former presidents, Dr. J. C. Norton, Phoenix, Ariz., president in 1904; Dr. D. F. Luckey, Tarkio, Mo., president in 1907; Dr. R. W. Smith, Concord, N. H., (1937); Dr. W. H. Hendricks, Salt Lake City, Utah (1943); Dr. J. V. Knapp, Tallahassee, Fla. (1948), and Dr. T. O. Brandenburg, Fargo, N. Dak. (1949), were present for this ceremony. The presentations were made by the secretary, Dr. R. A. Hendershott. Doctor Norton is the oldest living ex-president of the Association. Of the 54 former presidents only 17 are still living.

Proposed Change in Organization

Two motions of more than usual significance were adopted. One provided for a committee to prepare amendments to the by-laws of the

Association that would place greater control in the individual members. At present, practically all activities of the Association are under the control of an executive committee comprised of one representative from each of the 53 official memberships and the five officers of the Association. A proposition submitted by the committee to include representatives of ten national livestock associations on the Executive Committee was rejected by the Association and a proposal made to include in the Executive Committee one representative of the livestock producers in each of the 48 states was substituted. Under the constitution, final action on amendments must lie over for a year. Hence this proposal will come before the Association again at the Kansas City meeting next year, if it is approved by the Executive Committee. Predictions that it will encounter a veto in the "security council" were not wanting. However, a better guess seems to be, the proposed amendments with some compromise changes will be reported out by the Executive Committee and adopted; vetoes being in bad grace just now.

Hog Cholera Eradication

Another motion which was adopted provided for the appointment of a committee, including representatives of the producers, marketers, and processors of swine, the manufacturers of hog cholera antiserum and vaccines, the A.V.M.A., veterinary practitioners, research workers in the field of swine diseases, the Bureau of Animal Industry, USDA, and the state livestock sanitary officials, to survey the prospects for the eradication of hog cholera at the national level, and if deemed feasible, now or in the near future, to prepare general plans, estimates of cost and time required to achieve it.

Officers for 1951

The election of officers resulted in the promotion of F. E. Mollin, Denver; R. L. West, St. Paul, and T. Childs, Ottawa, Canada, first, second and third vice-presidents, respectively, to the positions of president and first and second vice-presidents, and the election of F. G. McMahon,* Phoenix, Ariz., to the office of the third vice-president. Dr. Ralph A. Hendershott, Trenton, N. J., state veterinarian of New Jersey, was reemployed for the office of secretary-treasurer.

President's Annual Address

The president of the Association, Dr. C. P. Bishop, Harrisburg, Pa., was unable to attend the meeting, owing to illness in his family, and his address was read by the secretary. Excerpts from the address are:

Many in this country take the health of livestock for granted, nevertheless we suffer extensive losses from diseases, many of them unnecessary.

Control, and perhaps eradication, of some diseases has been unduly delayed. Market restrictions on some food products can be expected to increase in some instances if corrective action is delayed much longer.

Dr. Charles P. Bishop, Director of the Bureau of Animal Industry, Pennsylvania Department of Agriculture, Harrisburg, retiring president.

The unrestricted distribution of Brucella vaccine handicaps the eradication of brucellosis.

Eradication of disease is impossible without research to develop the means for accomplishing it.

In some states, more than 90% of the tuberculin testing is conducted by accredited veterinarians; less than 10% by whole-time state and federal employees.

Official tuberculin testing began in Pennsylvania in 1893. It was a quarter of a century later that this association took it up.

Tracing cattle found to be affected with tuberculosis at slaughter to the source from which they came is the most important task at this stage of the tuberculosis eradication program.

Brucellosis eradication has been delayed because there is more than one type and more than one host of the Brucella organism. Eradication means the elimination of all types of the disease. The ring test for brucellosis appears to have particular value in area testing.

Community sales probably represent the oldest form of barter. Unless strictly regulated they may be important spreaders of disease. In the past they have hindered disease eradication and control.

*Doctor McMahon was taken ill immediately following the adjournment of the meeting and died November 22, 1950.

It is gratifying that an increasing number of veterinarians are taking an interest in the disease problems of the poultry industry. This trend should be extended and accelerated.

In the United States, foot-and-mouth disease is responsible for more jitters than any other disease of animals.

Support of Senate Bill 2188, which, if passed, will put the interstate transport of animals infected with brucellosis on the same basis as animals infected with tuberculosis, deserves our support.

The 1950 Annual Report

The following abstracts, excerpts and notes represent the opinions of the speakers to whom they are attributed as well as may be from memory, aided by a few longhand notes taken during the speeches. The comments, of course, represent only opinions of this reporter. It is hoped that veterinarians who did not attend this exceptionally important meeting may obtain from this report a useful acquaintance with the developments in animal disease research during the past year and the progress made in animal disease control during the same period.

This report, however, will not have accomplished its full purpose if it fails to implant in the reader a desire for the official annual report of the meeting. The official report will include the complete papers presented, and also those read only by title (not mentioned here) because of absence of the writers, together with a verbatim transcript of all discussions. It will comprise some 250 to 300 pages. The time to order it is now. Late orders for the 1948 and 1949 reports could not be filled because the supply was exhausted within a few weeks after publication. Orders should be sent to the secretary-treasurer of the Association. The price is $3. per copy, the same as the cost of membership, which includes a copy of the annual report. The writer knows of nowhere else where one may obtain so much veterinary information of a quality so high for so little.—*D. M. C.*

RESOLUTIONS

The usual resolutions were adopted thanking those who appeared on the program for their generous contributions to the success of the meeting; thanking the hotel management and employees for facilities and services provided for the Association and the members and visitors in attendance at the meeting, and commending local committees and organizations for their efforts to make the meeting pleasurable and profitable.

The resolution of the 1949 meeting, petitioning the Congress to authorize the Secretary of the U. S. Department of Agriculture to require manufacturers and distributors of certain biologicals to render concurrent reports of all sales and shipments to the chief livestock sanitary official of the state of destination, was reread. The products listed are:

1. Ovine ecthyma vaccine.
2. Brucella vaccines containing live organisms.
3. Hog cholera virus.
4. Swine erysipelas culture vaccine.
5. Newcastle vaccines containing live virus.
6. Laryngotracheitis vaccine.
7. Anthrax spore vaccine.
8. Tuberculin.

Poultry Inspection

The Committee on Meat and Milk Hygiene presented a resolution urging discontinuance of labeling noninspected, eviscerated poultry carcasses with USDA grade label on the ground that the consumer will be misled into believing that such poultry meat carrying a USDA label has been inspected for wholesomeness and is fit for human consumption when, in fact, the product is uninspected and the USDA assumes no responsibility for the wholesomeness of the meat.

Veterinary Vital Statistics

The Committee on Morbidity and Vital Statistics introduced several resolutions urging that the Bureau of Animal Industry and the Bureau of Agricultural Economics, USDA, be authorized to collect, assemble, classify, and publish animal morbidity and mortality information.

POLICY

The Committee on Policy recommended:

1. That the by-laws of the Association be amended to provide for the election of officers on the first or second day of annual meetings.

2. That annual meetings of the Association be extended to four days.

3. That district livestock sanitary associations be organized.

4. That a committee on "little known diseases" be added to the regular committees of the Association.

5. That the Committee on Policy be discontinued and its functions be assumed by the Executive Committee.

FOOT-AND-MOUTH DISEASE CAMPAIGN IN MEXICO

Notes from an address by General Harry Johnson, codirector of the Mexican-United States Joint Commission on Foot-and-Mouth Disease.

General Johnson was in Phoenix during the meeting and visited one session of the U.S.L.S.A. meeting to see friends. In response to an invitation from the president, he spoke informally concerning the program of aftosa eradication in Mexico.

The infected area was as great in extent as the combined area of California and Texas and contained 17,000,000 head of livestock. Three-fourths of that number were vaccinated four times, the remainder three times; altogether more than 63,000,000 vaccinations. For the past two years, the cooperation of the cattle owners in Mexico has been good.

Forty outbreaks of aftosa occurred in cattle that had been vaccinated once (average of one outbreak to each 425,000 vaccinated animals). Four outbreaks occurred in animals vaccinated twice (one outbreak to 4,250,000 vaccinated animals). But no animal vaccinated more than twice has developed the disease (to November 1, 1950). Altogether more than 100,000 premises were disinfected, chiefly, of course, before vaccinating was commenced.

It would be unwise at this time to say the outbreak is over. No case of aftosa has occurred since December 16, 1949, but since that date all the animals of susceptible species in the infected area have been immune. Vaccination was discontinued July 31, 1950. The immunity from vaccination will carry on four months or until November 30, 1950.

After that, if infection still persists in Mexico we may expect outbreaks of the disease. It is planned to keep careful watch over the entire infected area for a year. If the disease does not reappear before November 30, 1952, we shall regard the Mexico outbreak of 1946 eradicated.

By way of comment it may be said that the fight against foot-and-mouth disease in Mexico has been a costly one, but it will be worth the cost and more if our livestock disease control authorities have learned the lesson that in the eradication of any disease for which a fairly effective vaccine is available, vaccination should be the main reliance. It reduces the problem to manageable proportion and renders feasible such additional measures as may be necessary.

The contrast between the handling of foot-and-mouth disease in Mexico and of brucellosis in this country is too obvious to escape the attention of the livestock industry.

With a vaccine affording a period of immunity but one-sixth as long as that afforded by strain 19, General Johnson and his coworkers suppressed a disease ten times as infectious as brucellosis, and did it in one year from the time his program was well under way, (January to December 1949). But he didn't do it by vaccinating one animal in 40 each year, which about represents the achievement of our forces combating brucellosis so ineffectually for a dozen years past. Nor have the brucellosis forces had to combat swamps, jungles, mountain fastnesses, as was the case in Mexico; made more difficult by a difference in language, unknown customs and in the beginning, an uncooperative livestock industry. Our hoary brucellosis project desperately needs a General Johnson.

WHAT IS KNOWN ABOUT IMMUNITY TO BRUCELLOSIS

Abstract of a paper presented by K. F. Meyer, D.V.M., Ph.D., M.D., Director, George Williams Hooper Foundation, University of California, San Francisco.

Human beings differ considerably in their reactions to the organisms which sometimes cause brucellosis (undulant fever, Malta fever, Mediterranean fever). The infection rate in exposed groups may be low or it may be quite high. Probably about 50% of the population is susceptible to invasion by Brucella, and of that group most will be infected without knowing it, but others will be severely ill. The manner in which the infected react is significant because brucellosis menaces man's health and is of considerable economic importance to the livestock owner. The concern of the grower is how he can protect himself and his domestic animals against this infection. It is here that immunity enters the picture.

Dr. K. F. Meyer

Individuals with strong natural constitutional resistance to this infection will rid themselves of it without difficulty; even though they are exposed to large numbers of virulent Brucella organisms for an extended period. Others will contract a severe disease after a slight exposure for a short time. Experimental work through the years fully supports the idea that resistance is a component of the hereditary genetic constitution of both man and animals. This suggests the possibility that cross-breeding animals might offer a solution; though perhaps a revolutionary one, to the Brucella problems. *It also presents the idea of interest to cattle breeders who may inadvertently breed cattle with a low hereditary resistance to this infection.*

Although they will become infected under excessive exposure, the young, in general, have a stronger resistance to the infection than the old; with sexual maturation, the incidence increases. Exactly what factor causes this apparent decline in immunity is not known.

There is a great deal yet to learn about the cellular reaction of the infected to Brucella. More must be learned, too, about that component of the bacteria, the antigen, which stimulates the immunity mechanism of the body. Although something is known about the anti-brucellar action of the blood, comparatively little precise knowledge of the various constituents is available and without it, knowledge of immunity to Brucella infection will remain incomplete.

Another little studied and incompletely understood host reaction to Brucella is allergy manifested in the allergic skin test. This test gives no indication of the strength of the individual's immunity. In addition, immunity in man itself is relative. For these reasons, an individual's resistance cannot be determined by the intensity of the allergic reaction.

Once an animal has been infected, it is probably less likely to become infected again, but if it recovers completely, reinfection is possible. Cows that have aborted, seldom abort again because their immunity mechanism has been activated against Brucella. Again, constitutional factors are determinative and immunity is only relative.

Early attempts at preventive inoculation against brucellosis provided unsatisfactory protection to man. Although the incidence of abortion among inoculated cattle was lower, they became carriers and shedders, and brucellosis obviously could not be prevented by this means. More recently, many reports have been published on the successful immunization of cattle with a living avirulent strain (strain 19). A special type of living weak organism provides a more desirable type of immunity because it invades, multiplies and temporarily persists in the tissues; but does not cause the disease. Thus complete antigenic units are brought into direct contact with the antibacterial cells of the body and hence leave a permanent imprint on these cells and their descendants.

The duration of the immunity, provoked by strain 19, is not definitely known. Since it is relative, revaccination alone will assure complete protection. Vaccines prepared with this strain do not immunize swine or goats and the strain has caused infection in laboratory workers and vaccinators. The ideal strain has probably not been found, because developing such

a strain is too complicated and expensive. Preparation of an ideal vaccine is by no means a simple matter. It is important to emphasize that vaccination is probably no more effective than infection in protecting an animal against infection. Preventive medicine and public health demand the eradication of Brucella infection from domestic animals. They expect this to be done in a manner not detrimental to the economy of the livestock owner. Vaccination, in combination with the progressive elimination of the sources of infection, the shedders and carriers, will assure success.

The author included in his address a long scholarly discourse on immunity or resistance to disease, constitutional or hereditary, naturally acquired, and artificially induced, but "devoid of the ballast of repetitious statements." It does not lend itself to condensation. It may be mentioned that he stressed that all types of immunity are relative and can be broken down by massive infection. In brucellosis, this is particularly easy of accomplishment since there is no artificial immunity to this disease, in domestic animals or man, that is not readily overcome by massive infection. He postulates that since 50% of mankind are naturally immune to clinical infection with *Br. abortus* and this resistance is inherited; and since an unknown percentage of cattle seem to possess the same characteristic, *it might be possible by selection to develop strains of cattle with sufficient natural resistance to the disease to protect them from ordinary field exposure.*

It is the author's contention that "highly invasive and infective strains of *Br. abortus* produce a higher degree of immunity than do attenuated strains"; also "it is unlikely that vaccination is any more effective at the present time than infection itself in protecting an animal against brucellosis," since the immunity depends upon hereditary constitutional factors and is, therefore, too often relative. Suitable procedures for renewing immunity at frequent intervals must be adopted.

BRUCELLOSIS ERADICATION PROJECT

Abstract of a paper presented by Asa Winter, D.V.M., Assistant in Charge of the Brucellosis and Tuberculosis Eradication Division, Bureau of Animal Industry, U. S. Department of Agriculture.

During the year there has been a noticeable reaction from members of the livestock industry, regulatory groups, and the general public to the necessity of advancing a type of brucellosis program that will lead to eventual eradication of this disease from all domestic animals. This urge has been stimulated by a better understanding of the economic potentials of this no. 1 disease menace of the livestock industry in this country, and to a better appreciation of brucellosis in domestic animals as the only source of Brucella infection (undulant fever) in the human family.

Approval by the Bureau of a uniform brucellosis program which recognizes choice of plans adaptable to individual herd and area conditions, the educational background which has been provided on the disease, and the national program for its eradication, have been prominent factors in establishing agreement in the industry on the need for eradication and confidence in the ability of cooperating agencies to handle the task.

The lead taken by the U. S. Extension Service, as cosponsor with the Bureau in developing regional brucellosis conferences, and the follow-up by state extension representations on educational phases of the project, must be given special credit in evaluating the progress being made.

Organization of county and state brucellosis committees, representative of local interest, which will correlate their efforts with those of the national committee, is providing support for the program at the county and state level, where it is most effective.

The continuing increase in both blood-testing and vaccination stresses the veterinary manpower requirements that must be met under present procedures if the brucellosis eradication program is to be consistently advanced. As a possible aid in keeping pace with the mounting demands for testing, the milk ring (ABR) test is being used experimentally in several states to determine its effectiveness as a herd screening device. If it can be determined that this test will serve to locate herd sources of infection within an area, the field operations incident to a testing program will be minimized to a large degree and expansion will be possible without a proportionate increase in personnel.

With the growth of the program, it is becoming more evident that efforts must be consolidated as soon as practicable on an area-testing basis, and every protection must be afforded clean herds and clean areas by controlling movement of infected animals and those of unknown status. The community auction market, unless carefully regulated, can serve as a potent factor in the dissemination of this and other diseases. Legislation governing operation of these markets will do much to aid the brucellosis eradication program.

The organization, accepted procedures, and growing public support necessary to advance

the eradication program, are all available. There should be no reason for delaying united action, in view of the importance of this disease to the economy of the nation and the health of the population.

The federal Bureau of Animal Industry is collecting information on the use of strain 19 vaccine in the following categories: (1) constancy of immunizing properties; (2) respective merits of subcutaneous and intradermic vaccination and the persistence of agglutination titers induced by each; and (4) revaccination.

In the movement of reactors or cattle of unknown status, the author believes that control of the animal "through whatever channel of trade it may enter is essential if the eradication plan is to succeed." Proposed legislation to give the Secretary, U. S. Department of Agriculture, authority to regulate interstate movement of Brucella infected cattle (Senate Bill 2188) has been introduced in the Congress and hearings have been held for interested members of the livestock industry. Further action was deferred to await discussion of the subject at the meeting of the U. S. Livestock Sanitary Association.

Brucellosis Testing and Calf Vaccination

Both blood testing and calf vaccination were stepped up during the 1950 fiscal year; the former slightly and the latter 31% to number 2,065,063 calves. The percentage of reactors to the agglutination test decreased from 4 in 1949 to 3.5 in 1950. These figures refer to official testing and vaccination; that done privately, probably considerably greater in amount, is not included in this report.

The increase of nearly one-third in the number of calves vaccinated is the most hopeful circumstance in connection with the eradication project for the year. It signifies an increasing number of herds and individual animals with increased resistance to Brucella infection. The author stressed the importance of vaccination but didn't go much farther than to hope for more of it. Unquestionably the vaccination of previous years is chiefly responsible for the decline in the percentage of reactors to the test during the past year. It also signalizes some relaxation of official opposition to vaccination which has laid a paralyzing handicap on the eradication project for a decade in more than one-half of the states.

Inconceivable as the matter may seem, statistics are not available on the percentage of calves officially vaccinated in the field that later develop Brucella infection, but some veterinarians who have done a large amount of private vaccination for more than a dozen years, place the number in infected herds at definitely fewer than 5% as a result of normal herd exposure.

In the BAI experiment with calf vaccination, only 1.4% of the vaccinated animals were infected by natural exposure in infected herds. Many practitioners place the failures in the field at less than 2%. Allowing for 5%, it is obvious that if for the next five years, every heifer kept for breeding were vaccinated between the ages of nine and 12 months, the average number of new cases of brucellosis in infected herds would be reduced enormously and the eradication problem would be cut down to boy's size.

BRUCELLOSIS SPREAD THROUGH ARTIFICIAL INSEMINATION

Doctor Bendixon, a Danish veterinarian, was a visitor at the Phoenix meeting of the U. S. Livestock Sanitary Association. When called upon by the president for remarks, he recounted a number of instances in Denmark in which territory freed of brucellosis was widely reinfected by the use of infected bulls in artificial insemination rings.

Following much discussion, it was concluded in the 1920's that it was safe to mate bulls that reacted positively to the agglutination test for brucellosis, to nonreacting cows.

In the 1930's, artificial insemination became the general practice in Denmark. Bulls were used for semen production without regard to their brucellosis history or condition.

An island was cited from which brucellosis was completely eradicated. A short time later some suspect abortions occurred and an investigation revealed that more than 30% of the cows were reactors. An examination of the semen of the bull involved showed that large amounts of *Brucella abortus* were being eliminated in it. When cultured, the plates were overgrown with Brucella organisms.

Soon another instance cropped up, also on an island that had been freed of the disease. In this case, 71% of the cows that had been inseminated with the semen from one bull were reactors and they were the only cows on the island that reacted positively to the blood test.

A serious outbreak of brucellosis occurred on an island that had been freed of the disease for a considerable period. On a retest of all cattle on the island, some 40 to 50 herds contained reactors. In 26 of these herds, the only cows infected were cows that had been inseminated with the semen of a single bull. In the

remaining herds abortions had occurred and the infection had spread more or less widely.

A blood test of all bulls used for artificial insemination and a bacteriological examination of the semen of each, discovered a number that were rapidly undoing the work of brucellosis eradication. There were a number of reacting bulls that appeared not to have transmitted the disease.

In Denmark, it is now required that all bulls used to supply semen for artificial insemination must be given the blood test once a year and a rigid bacteriological examination of the seminal fluid is made twice a year. The seminal fluid also must be given the agglutination test, twice yearly.

It was something of a surprise to find bulls producing semen heavily contaminated with Brucella that did not infect cows by natural mating, notwithstanding the semen infected a high percentage of cows that were artificially inseminated with it.

BOVINE, AVIAN, AND SWINE TUBERCULOSIS ERADICATION

Abstract of a report presented by A. K. Kuttler, D.V.M., Veterinarian in Charge of the Brucellosis and Tuberculosis Eradication Division of the Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

The author credited action taken at the preceding meeting of the Association (Columbus, Ohio, October 1949) with aiding materially in reviving interest in bovine tuberculosis eradication and stated that the consistent support the Association has given this project over the years has greatly strengthened the program.

The time it has taken to reduce tuberculosis in cattle to its present low state seems long to some persons, but more thoughtful individuals consider the eradication project the most outstanding achievement of our generation in the field of public health and economical livestock production. In some countries, 25 to 50% of the cattle are infected and thousands of new cases of the bovine type of tuberculosis infection in man develop every year. In this country a case of the bovine type of tuberculosis in man is a rarity.

The total number of cattle tuberculin-tested in the tuberculosis eradication project 1917 to 1950 is 322,474,607. The reactors to the tests numbered 3,978,763. The five states that head the list in the number of tests are: New York, 34,054,329; Iowa, 27,816,094; Wisconsin, 25,787,179; Illinois, 24,717,321, and Minnesota, 20,827,075. The greatest number of tuberculin tests in any one year, 25,237,532, were made in 1935; the smallest number, 20,101, in 1917. The lowest average appraisal of reactors, $54.80, was in 1934, and the highest, $285.78, in 1949. The average appraisal value of reactors in 1950 was $272.87.

Our goal in tuberculosis eradication, the only goal about which we are concerned, is elimination of the last infected animal.

The goal in tuberculosis eradication is elimination of the last infected animal. The present low incidence of bovine tuberculosis, in which the veterinarian has played a most prominent part, is considered to be the most outstanding achievement in the field of public health and economical livestock production during the last 50 years.

The change in the rules for reaccreditation recommended by this association last year and approved by the Bureau to become effective January 1, 1951, provides that, except range and semirange stock, all cattle in an area must be tested every six years for the area to remain accredited. Heretofore, accreditation could be maintained by spot-testing at three-year intervals. Since sometimes as few as 1% or 2% of the cattle in an area were included in these spot-tests, the new regulation will impose a great deal more testing for reaccreditation than has been the case in the past, when after an area became accredited a great majority of the cattle were never tested, except as they may have come within state or municipal requirements for testing of animals supplying milk for public sale.

For a number of years we have not been eradicating tuberculosis, but merely holding the line. We shall never reach the goal by such means. In addition to the greatly increased amount of testing which will begin the first of next year, careful consideration should be given by this association, to all other means of locating foci of infection. Second only to tuber-

culin testing as a means of locating infection on farms and stopping its spread, is tracing animals found to be infected at time of slaughter to their points of origin. At the present time, only 25% of such animals can be traced back to the herd from which they came. Additional legislation will be required in some states

Naturally infected tuberculous chickens. Emaciation noted in these birds is a common symptom.

to enforce better record-keeping and better cooperation from transportation agencies, other than railroads. The importance of increasing vigilance in areas originally infected and closer and more determined follow up in "problem herds," was stressed. Greater restrictions should be imposed in moving apparently healthy animals from infected herds. The aggregate cost of all these auxiliary means of locating foci of infection will be insignificant compared with the cost of locating the same foci by area testing.

There were 9,439,811 cattle tested during the 1950 fiscal year (July 1, 1949 to June 30, 1950). This number was about the same as for the preceding year. The number of reactors was 17,733, (0.19%). In 1948 and 1949, the percentage of reactors was the same.

Avian Tuberculosis

Surveys were continued in the nine midwestern states, where the incidence of tuberculosis is high among poultry flocks. It is stressed continually that the key to the eradication of avian tuberculosis is the maintenance of all-pullet laying flocks. In breeding flocks, all birds retained more than a year should be tuberculin-tested annually.

When tuberculosis is controlled in poultry, the disease will automatically be reduced to a low incidence in swine.

TRACING TUBERCULOUS CATTLE FROM THE ABATTOIR TO THE POINT OF ORIGIN

Abstract of a paper presented by H. A. Milo, V.M.D., Chief of the Tuberculosis Eradication Division, Bureau of Animal Industry, Pennsylvania Department of Agriculture.

In introducing his subject, the author briefly reviewed the history of bovine tuberculosis control and eradication in Pennsylvania since the first tuberculin test in that state, and, as he claimed, the first in the United States, was conducted by Dr. Leonard Pearson in March 1892.

Tuberculin-testing was continued on a limited scale from 1892 to 1901 when what was long known as the Pennsylvania plan was adopted. Under this plan an indemnity was paid by the state for reactors and the work was speeded up materially.

In 1917, when the federal-state cooperative project was launched, tuberculin-testing in Pennsylvania was continued under that plan. Federal money for indemnities became available in 1918. The first county-wide test was applied in 1923, after which the area plan and the individual accredited herd plan were prosecuted vigorously until December 1936 when the whole state was declared a modified accredited bovine tuberculosis free area. At the first state-wide test under the area plan, 9.29% of 1,225,000 cattle reacted positively to the test. At the last state-wide test of all dairy and breeding cattle, only 0.17% of approximately 1,400,000 reacted. A total of 15,000,000 tuberculin tests and the removal of 326,863 reactors were required for the state to reach the modified accredited area status. Indemnities in excess of $21,000,000. were paid by the state and federal governments.

There are 7,200 accredited herds containing 179,093 cattle in Pennsylvania. At the last complete test of these herds, 0.22% reacted.

In addition to the abattoirs at which federal meat inspection is maintained, the state

conducts inspection at 46 meat packing plants. In so far as possible, animals in which lesions of tuberculosis are detected on postmortem examination at these plants are traced back to the farms from which they came and all cattle on the premises are tuberculin-tested immediately. This means of locating foci of infection and eliminating them promptly has proved of great assistance in the work of eradication.

Of 64 tuberculous animals reported in the regular kill in 1948, 45 were traced back to herds containing 996 animals from which 155 reactors (15.6%) were removed on the first test, 38 on the first 60-day retest, 35 on the second retest and two on the third retest—a total of 230 reactors (23%).

Of the 100 tuberculous animals reported by the abattoirs in 1949, 68 were traced to herds containing 1,648 animals from which 293 reactors (17.7%) were removed by the first test. This constituted 41.8% of all the reactors in the state reported in tests under the cooperative project for the same period.

Every effort will be made to improve the records to the end that a much higher percentage of the animals, discovered on postmortem examination at abattoirs to be tuberculous, may be traced to points of origin.

CONTROL OF BOVINE TUBERCULOSIS IN CANADA

Abstract of a report by K. F. Wells, V.S., D.V.M., Associate Chief Veterinarian, Health of Animals Division, Department of Agriculture, Ottawa, Ontario, Canada.

This report dealt briefly with tuberculosis control in Canada during the last 54 years and summarized the progress of the period since the close of World War II.

In 1896, official bovine tuberculosis control in Canada was commenced with the free tuberculin-testing of a small number of herds; compulsory marking of animals reacting to official or private tests were made compulsory in 1903; the Supervised Herd Plan was inaugurated in 1905; in 1914 the Municipal Tuberculosis Order went into effect. The Accredited Herd Plan was added in 1919 and has continued to the present day. In 1922, the Restricted Area Plan superseded the Supervised Herd Plan and the Municipal Tuberculosis Order gradually fell into disuse and all official control has since been carried on under the Restricted Area and Accredited Area plans, principally the former. When the infection among all the cattle in a restricted area has been reduced to 0.5% or lower but not lower than 0.2%, it becomes an accredited area for a three-year period. If the infection is 0.2% or less it holds this status for six years.

"Spot testing" is not authorized for reaccrediting. All cattle in an accredited area must be tested for reaccreditation.

During the war, tuberculosis control was of necessity curtailed, but since April 1945 the work has been pressed forward as fast as the available personnel will permit. During the fiscal year ending March 31, 1950, 2,571,587 cattle were tuberculin-tested. Of this number, 31,864 or 8.16% reacted. Of the reactors, the entire carcasses of 10.2% were condemned on slaughter and 28.3% were "no visible lesion" carcasses. Ninety per cent of these reactors were a result of testing in the densely populated eastern section of the country, which was largely initial testing.

As of August 1, 1950, 5,453,931 cattle, 60% of the total number in the country, were enrolled under the Restricted Area Plan and an additional 6.7% were handled under other control plans. This was an increase of 31.6% in the restricted area category. A considerable number of restricted areas are about ready for accreditation and it is confidently expected that in the future the declaration of accredited areas will proceed more rapidly than it has, even in the past five years.

SIX-STATE TEST OF HUDDLESON'S MUCOID VACCINE FOR THE PREVENTION OF BRUCELLOSIS

Notes from a report presented by T. C. Green, D.V.M., Charleston, West Virginia.

This cooperative experiment conducted under the direction of the livestock sanitary officials of West Virginia, Virginia, Maryland, Pennsylvania, New Jersey, and Ohio, and with the financial support of certain livestock breeders, was described in VETERINARY MEDICINE at its inception (43:359 [Sept.], 1948). Much was expected of it and the disappointment caused by this first report is correspondingly grave. The whole story of this 22-page report is condensed into 26 words—"It therefore appears that definite conclusions as to the possible value of 'M' vaccine cannot be formulated from the limited data of the present test"—the concluding sentence of the author's summary.

PROBLEMS OF THE LIVESTOCK INDUSTRY CREATED BY ATOMIC EXPLOSIONS

Notes from an address by Wright H. Langham, B.S., M.S., Ph.D., Assistant Health Division Leader and Director Biomedical Research, Los Alamos Scientific Laboratory, Los Alamos, New Mexico

Scientists were not surprised by the announcement that the Soviet Union has the A-bomb. Any nation that is willing to bear the cost of the A-bomb can have it. If it has the facilities for delivering it on enemy objectives, it can use it. It is, therefore, appropriate for the livestock industry and all other groups to investigate the effects of atomic explosion on its own particular industry. We shall probably receive the A-bomb before we deliver it.

A book published by the Los Alamos laboratory supplies the most authentic information available on atomic explosions.

An atomic bomb is like an ordinary bomb, but is at least 1,000 times greater. It produces direct and indirect injuries. The flash from an ordinary bomb may burn buildings and animals. An atomic bomb has the same effect at much greater distances. It also produces a radiation effect capable of producing biologic injuries of two kinds—direct and indirect.

The blast or force of the explosion of an atomic bomb is, as stated, no different from that of an ordinary bomb, except that it is at least 1,000 times as great. A blast pressure of 35 pounds per square inch will produce serious hemorrhage of the lungs. On the body of a cow, 35 pounds per square inch amounts to a total pressure of more than 50,000 pounds. An atomic bomb produces this pressure within a radius of 1,500 feet or nearly one-third of a mile.

A pressure of two pounds per square inch will destroy wooden structures. This pressure extends to a distance of two miles from the explosion. A pressure of 5.2 pounds per square inch will destroy brick buildings; this pressure extends to a distance of 1¼ miles.

Injury to persons or animals may also result from being thrown against buildings, trees, or other objects and from falling structures destroyed by the blast.

An explosion, such as that set off at Alamogordo, causes complete destruction of all structures within a radius of one-half mile; severe damage within one mile, repairable damage in an area from one to 1⅝ miles distant, light damage up to two miles and window and plaster breakage to a distance of eight miles or more. The danger interval from blast is ten seconds and the danger area to persons and animals from blast includes all within a radius of two miles from the explosion.

In addition to its blast effect, an atomic explosion also produces intense heat. Three calories per square centimeter will burn unprotected skin of man. This effect is produced to a distance of 2¼ miles. Ten calories per square centimeter will ignite wood, straw, and similar materials. This temperature is built up to a distance of 1¾ miles.

The thermal radiation represents about one-third of the energy of an atomic bomb and is capable of appalling devastation in direct burns and in the fires it ignites. Furthermore, the substances it vaporizes are capable of carrying nuclear rays considerable distances and showering them miles away from the explosion.

Thermal radiation takes place very quickly —in three or four seconds. After ten seconds there is no further danger of burns except from secondary fires ignited by the flash heat or caused by overturned stoves, electrical short circuits, broken gas pipes, etc., due to the blast effect of the explosion. In the Nagasaki explosion, burns were responsible for more than 50% of the deaths.

A characteristic feature of burns due to thermal radiation is sharp limitation to unprotected surfaces facing the center of the explosion.

A third injurious effect of atomic explosions is due to nuclear radiation, chiefly gamma rays which are quite similar to *x*-rays. Thus an atomic bomb is three weapons in one—blast or shock, thermal radiation or heat, and nuclear radiation—each weapon is a killer in itself.

An instantaneous dose of 400 roentgens will kill 50% of persons exposed to it. This intensity can be expected within a radius of 4,500 feet or more than five-sixths of a mile. The symptoms are: nausea and vomiting, mass hemorrhage into the intestinal canal, fever, stomatitis, diarrhea, inappetence, and malaise. If symptoms of radiation injury appear within a week of the injury, there is little chance of recovery. If the initial symptoms occur more than a week after the injury, the chances of recovery are fairly good with proper nursing and treatment. Whole blood transfusion and continued administration of antibiotic agents constitute the basis of treatment. The white blood cell count in radiation victims often falls to zero and, therefore, infections are an ever present danger.

The foregoing refers to initial radiation. When an atomic explosion occurs near the surface of the ground or under water, a vast amount of residual radiation results from fission products carried upward by the "atomic

cloud" and communicated to objects and water by the explosion. The initial radiation danger lasts not longer than one minute, but danger from residual effects may persist for a long period, even years. Radiation particles may fall from the atomic clouds miles from the explosion.

Nuclear radiation caused about 15% of the deaths due to the Nagasaki and Hiroshima explosions. Those bombs were exploded at a height of 2,000 feet for maximum surface destruction. The explosion at Alamogordo occurred only 100 feet above the surface of the desert and resulted in the vaporization of ten million tons of sand, earth and stone, which became a part of the atomic cloud. An explosion under water causes the greatest atomic cloud of radiant particles. In the explosion at Bikini, the atomic cloud rose to a height of 9½ miles.

Three hundred fifty cattle on a range 15 miles from Alamogordo were blistered by radiant particles falling from the atomic cloud. Later these animals shed their coats till their skins were bare. They remained healthy for a period of two years; were slaughtered and exhibited no lesions of injury on postmortem examination.

There is little likelihood that large collections of animals will ever be a primary target of atomic bombs. However, a large number of animals in stockyards near important manufacturing facilities, large railroad terminals or docking facilities might suffer from atomic bombing of the other installations.

LABORATORY STUDIES ON THE IMMUNIZING VALUE OF HEMORRHAGIC SEPTICEMIA BACTERIN AND BLACKLEG BACTERIN

Abstract of a paper presented by I. S. Danielson, Ph.D., and R. Bolton, B.S., Lederle Laboratories Division, American Cyanamid Company, Pearl River, New York.

The widespread use of hemorrhagic septicemia bacterin and blackleg bacterin is indicated by the production figures issued by the U. S. Bureau of Animal Industry for the fiscal year ending June 30, 1950. During this period, over 100,000 liters of bacterin containing the blackleg component, and over 68,000 liters of bacterin containing the hemorrhagic septicemia component were produced in licensed establishments.

In spite of the fact that wide usage of these products has established their effectiveness in the field, there have been apparent failures among some vaccinated animals. Such failures may not necessarily prove that the product used was of poor quality. Such factors as improper storage of the bacterin, improper use, condition of the animal at time of inoculation, refractory condition of individual animals and recent exposure to infection prior to inoculation, must be considered.

A number of attempts have been made to establish a test method for laboratory evaluation of these two products. The authors report some of their laboratory experiences in the evaluation of these products.

It has been the common experience among investigators studying the pathogenicity of *Clostridium chauvei* for the guinea pig to find that relatively large volumes (0.25 ml. to 1 ml.) of freshly grown culture, injected intramuscularly, are required to establish a fatal infection. The results have not been consistent nor easily reproducible. However, by taking advantage of the technic first proposed by Bullock and Cramer (1919) for activating anaerobic spores with calcium chloride, a fatal infection of *Cl. chauvei* in guinea pigs can be produced regularly with a many thousandfold reduction of the organisms otherwise required to establish an infection. It was found necessary to treat the injection site with an antiseptic solution, such as tincture of iodine, to obtain consistent results. Pathogenic organisms on the skin may otherwise be carried into the injection site and establish a fatal infection. The challenge dose of *Cl. chauvei* organisms for guinea pigs consists of the selected number of spores suspended in 1 ml. of 2.5% calcium chloride ($CaCl_2.2H_2O$) solution, injected intramuscularly into a hind limb.

With a reliable challenge available, it has been possible to demonstrate a high degree of immunity established in guinea pigs following two 1 ml. subcutaneous doses of a good blackleg bacterin or a mixed bacterin containing the *Cl. chauvei* component. Although this method will not establish relative immunizing values of a series of bacterins, it is capable of detecting a markedly inferior product. If guinea pigs are immunized with only one dose of bacterin, the survival rate upon challenge with an activated spore suspension will vary widely.

For the laboratory evaluation of hemorrhagic septicemia bacterin, several laboratory animals are available which are highly susceptible to fatal infection with *Pasteurella multocida* organisms. The animal chosen was the Swiss white mouse. The evaluation of hemorrhagic septicemia bacterin thus became a study on the conditions required in the preparation of such a bacterin. The authors proved that an effective vaccine, as measured by protective

tests in Swiss mice, can be prepared from highly virulent strains of *P. multocida* grown in fluid media under conditions permitting rapid growth of the organisms. The formalin-killed vaccine prepared in this manner will confer marked protection in Swiss mice against a 100 to 1,000 m.l.d. of virulent culture challenge if immunized by intraperitoneal injection of two 0.5 cc. doses of vaccine containing 1 to 10 million organisms per dose, at a weekly interval. However, a one-dose immunization schedule fails to show marked protection under these conditions.

By the use of this technic, we have not been able to demonstrate marked cross immunization protection between the various serological types of *P. multocida* described by Little and Lyon.

ICTEROANEMIA IN SWINE

Abstract of a paper by Earl J. Splitter, D.V.M., M.S., Assistant Professor of Pathology, School of Veterinary Medicine, Kansas State College, Manhattan.

Recent field and laboratory investigations reported by the author have contributed materially to the information extant concerning icteroanemia in swine, including the discovery that it is caused by the *Eperythrozoon suis*, a widely disseminated organism resembling the *Anaplasma marginale* and heretofore thought to be innocuous. The natural conditions under which this organism becomes pathogenic for swine are not known. Previous investigators were unable to produce the disease experimentally, but the author succeeded by injecting the organism intravenously in splenectomized pigs; producing a disease that duplicates the symptoms and lesions of the naturally acquired infection; which is known as icteroanemia over most of the Corn Belt. It was first recognized and reported in 1932 by Kinsley[1] who called it an "'anaplasmosis-like" disease.

Icteroanemia is an acute febrile disease of swine, primarily of the young. The predominating symptoms are hemolytic anemia and a conspicuous, generalized icterus. It is characterized by low herd morbidity and high case mortality. The clinical entity seldom occurs in more than 10% of the herd; more often only one or two animals are affected. Subclinical attacks occur in all, or nearly all, of the remainder of the herd, *i.e.*, the *E. suis* can be found in the blood of most members of the herd during an acute attack of any of its members and a varying percentage on investigation will be found to carry an elevated temperature despite their normal appearance. The mortality in untreated cases ranges up to 50%. The disease responds promptly to neoarsphenamine therapy, if it be initiated at the onset of symptoms. Treatment is useless if inaugurated after severe destruction of the erythrocytes has occurred and the temperature has fallen, *i.e.*, after the second or third day of the attack. Recovered cases are permanent carriers of the eperythrozoa.

Diagnosis

The diagnosis of infectious icteroanemia of swine presents considerable difficulty. The possibility of eperythrozoonosis should be considered in all cases of anemia in this species. The history of the attack should be obtained. The acute disease is usually seen in young animals; it ordinarily occurs in summer or early fall when insects, which are believed to be vectors, are plentiful. Rare cases that occur in winter are believed to be recidivations from carriers. Icterus may or may not be present. Depression, anorexia and an elevation of the temperature (104 to 107 F.) may be the only symptoms prior to the development of anemia.

Microscopic diagnosis requires special attention to technic and interpretation. During early stages of the infection, Eperythrozoon in the blood may be few and hard to find. Staining of the organisms is difficult. The presence of these parasites in enormous numbers is of diagnostic significance.

Postmortem Lesions

Lesions in swine similar to those of anaplasmosis in cattle are pathognomonic for eperythrozoonosis. These lesions, in the carcass of an animal that has died of the disease are: thin watery blood, generalized icterus, heart and kidneys pale and flabby, hepatic degeneration, thick gelatinous bile and splenauxe.

Control

In the present state of our knowledge of eperythrozoonosis, little can be done to eliminate the source of the infection or limit the spread of the disease. Removal of the carriers is impracticable because of their numbers and the difficulty of identifying them. Control of the vectors appears to be fraught with equal obstacles. Presumably they are biting insects but their identity is unknown. The hog louse, *Haematopinus suis*, appears not to be involved in the transmission of this disease. It is cer-

[1]Kinsley, A. T., Protozoan-like Organism in the Blood of Swine. *Vet. Med.*, 27:196 (May), 1932.

tain that transmission is not through direct contact of a carrier or an acutely infected animal with a susceptible one.

An increased prevalence of icteroanemia has been noted following serum-virus vaccination of swine against hog cholera. If there be a casual relation there, it is probably a symbiotic one. It is not due to contamination of the virus blood with Eperythrozoon; at least in experimental attempts, the disease could not be communicated in this way.

RHINITIS OF SWINE·

Abstract of a paper by L. P. Doyle, B.S.A., M.S., D.V.M., Ph.D., Purdue University, Lafayette, Indiana.

When the word rhinitis is used broadly, it includes a number of disease conditions in swine. This discussion was limited to a disease which often causes deformity of the snout and

Dr. L. P. Doyle

results in considerable loss to the swine grower. The disease is known generally in the Corn Belt as dystrophic or atrophic rhinitis. Swine raisers in some parts of Europe have had long and costly experience with the disease. Published reports indicate that atrophic rhinitis has made profitable swine production impossible in some parts of that continent.

Observations of the disease in North America leave little doubt that it is capable of doing great damage to the swine industry under American conditions.

Both field observations and experimental work support the belief that the disease is infectious. Several farm herds have been observed in which atrophic rhinitis made the herds almost worthless by the end of three years. The chief losses result from retarded growth and delayed fattening. The death loss is low and the disease may be present in a herd for a year or more without being detected. Ordinarily an infected herd is decidedly unprofitable by the end of three years if nothing is done to control rhinitis.

The symptoms shown by infected animals are sometimes so vague that postmortem examinations are necessary to establish a diagnosis. Sneezing, more or less violent, is a common symptom. Nosebleed is likely to occur in, at least, a few animals in an infected herd. Sometimes it is serious. Rubbing the snout and shaking the head are common. A characteristic symptom is distortion of the snout and face. This symptom is not always present; and it may at times be difficult to distinguish from the dish-face which occurs normally in such breeds as the Berkshire and Yorkshire.

The final evidence of atrophic rhinitis can be seen only on autopsy. Atrophy or partial or complete absence of the turbinate structure can be considered as diagnostic of the disease.

Experience indicates that atrophic rhinitis may be brought into a healthy herd by animals from an infected herd. It is difficult to detect the disease in individual animals by clinical means, hence the whole herd in which affected animals are present should be regarded with suspicion.

Care should be observed to differentiate atrophic rhinitis from ordinary "bull nose." In the latter, granulomatous swelling may cause distortion of the snout as in rhinitis, but there is more or less necrosis and at times sloughing, including the skin. Postmortem examination affords pathognomonic evidence of atrophic rhinitis—partial or complete atrophy of the turbinates. In addition, there may or may not be accumulations of pus or other exudate in the nasal structure and in longstanding cases, lung lesions are common.

ERADICATION OF SHEEP SCABIES

Notes from a paper by H. E. Kemper, D.V.M., and I. H. Roberts, D.V.M., B.S., Zoological Division, Bureau of Animal Industry, USDA, Albuquerque, New Mexico.

Scabies is among the most persistent and destructive diseases of sheep. It is due to a mite, *Psoroptes equi* var. *ovis*, that punctures the skin and deposits in the wound a poisonous secretion which causes inflammation and intense itching. At first, only a small lesion is to be seen, but it extends and coalesces with others until large areas are involved and the animal suffers greatly.

The female mite lays 15 to 24 eggs beginning at 12 to 14 days of age. The mites are spread by contact, a method greatly favored by the habit of crowding together which is characteristc of sheep.

The record of scabies is as old as the history of sheep raising in central Asia. Its introduction into the United States seems to have been contemporaneous with the introduction of sheep. In 1896, England prohibited the importation of sheep from this country because of the prevalence of scabies among American sheep.

Scabies has been fought in this country for more than 50 years. Nearly every state has, at one time or another, employed persons whose sole official duty it was to fight sheep scabies. Mostly it has been a good fight and successful, but too often relaxed or abandoned too soon. At great cost the disease has been nearly eliminated from the southwestern states.

Lime and sulfur and nicotine dips have been used in the fight against scabies. They are effective and have been the means of eradicating the disease from large areas and millions of sheep. Both lime and sulfur and nicotine dips require to be repeated. They kill the mites, but do not prevent the eggs from hatching nor do they have any particular residual effect. They alone are approved for the movement of scabby sheep in interstate commerce.

Benzene hexachloride (BHC) and the pure gamma isomer of BHC have been experimented with widely in the past two years. Both preparations, the crude BHC and the refined gamma isomer (which is the effective factor in the crude preparation) are extremely destructive to the scab mite and both have a residual action that prevents reinfestation for from three to five months, and in some instances for periods up to eight months.

BHC and the gamma isomer are recommended for use in 0.06% strength of the pure isomer. They are effective in one-fourth that strength (0.015%) and are nonpoisonous in four times that concentration (0.24%). The 0.06% suspension is recommended to allow a margin of safety for use in the field. One dipping is effective for eradication of scabies from a band of sheep. Because there is no practical vat side test that will determine the gamma isomer concentration in a dip, BHC cannot be used for sheep which are to be moved interstate. The pure gamma in a strength of 0.06% or a 50% wettable BHC powder containing 0.06% of the gamma isomer should be widely used intrastate for the rapid eradication of the old enemy.

BHC possesses some disadvantages; (1) it is not soluble and settles out of the dip promptly if some means of agitating the suspension is not provided, (2) it is taken up in the fleece in disproportionate amount and thus the dip becomes weaker with use, and (3) as already mentioned, there is no vat side test to determine the concentration of the gamma isomer (lindane) in the dip. (For vat-side test see VETERINARY MEDICINE, 45:480 [Dec.], 1950.)

Advantages are its great margin of safety, its extraordinary effectiveness, its long residual effect and the fact that unlike the lime and sulfur dip it does not require heating, but may be used cold.

MORTALITY AND MORBIDITY DATA IN BRITAIN

Notes from an address by A. W. Stableforth, M.R.C.V.S., D.Sc., Director, Laboratory of the Ministry of Agriculture, Weybridge, England.

In Britain, mortality and morbidity statistics are collected under the authority of the Consolidated Diseases of Animals Act of 1894, and subsequent acts and orders which have been in operation for a great many years. It cannot be too strongly emphasized that these acts reflect the wishes of the farmers and owners of animals who recognize their value and rarely disobey them. Without such approval by livestock owners, these laws would be ineffective.

Any owner of an animal, or person having charge of an animal, suspected of being a notifiable case, or any veterinarian seeing such a case, is required to report it to the nearest constable who must notify the Division Veterinary Officer. Reports received by the Division Veterinary Officer (after a diagnosis is made, usually locally) are consolidated and reported fortnightly to the Weybridge Laboratory, which in turn publishes consolidated reports for all of Britain fortnightly. One of these reports (reduced) is reproduced on the following page. It will be noted that of the 13 diseases made notifiable by the Act of 1894, six have been eradicated and one has never breached the quarantine. In addition, parasitic mange of horses has disappeared, chiefly induced, no doubt, by the great reduction in the number of hosts. Fowl pest in the report refers to the disease known in the United States as avian pneumoencephalitis. Swine fever is British *patois* for hog cholera.

It will be noted in the fortnightly report that more than 100 outbreaks of foot-and-mouth

disease were eradicated in 1947 and that, even in a year when an average of two outbreaks occurred each week, they were suppressed so promptly that only an average of 100 animals per outbreak were infected and exposed. This indicates an extremely prompt report of the disease, confirmation of the diagnosis, and initiation of eradication measures. Incidentally, outbreaks of this disease in Britain for the first six months of 1950 numbered 14. All were eradicated promptly. The frequent outbreaks of foot-and-mouth disease are a source of anxiety to the animal disease control personnel, but they cause neither panic nor jitters among livestock raisers or veterinarians. The source of the outbreaks is mainly beef, which it is national policy to import in large quantities from countries in which foot-and-mouth disease is enzootic.

As of September 30, 1950, the "attested," *i.e.*, accredited tuberculosis-free herds, numbered 52,482 and contained 2,042,270 cattle, 22% of all cattle in Britain. In October 1950, area testing for the eradication of bovine tuberculosis was commenced.

The collection of morbidity and mortality statistics of important, nonscheduled diseases such as mastitis is voluntary and although less complete than for diseases scheduled in the Diseases of Animals Act of 1894, it is, nevertheless, adequate for determining the overall incidence, approximate cost, and result of various methods of treating. The collection of statistics for nonscheduled diseases is conducted mainly by the National Veterinary Medical Association, through its practicing members, with such assistance as the central laboratory at Weybridge is able to give in the discharge of its functions of diagnosis and research.

RABIES CONTROL PROGRAM OF WHO

Notes from an address by Harald N. Johnson, M.D., Laboratories of the International Health Division, Rockefeller Institute, New York.

World Health Organization (WHO) is one of the specialized agencies of the United Nations. At the first World Health Assembly in the Palace of Nations at Geneva, Switzerland in 1950, the subject of rabies was taken up for consideration. (See VETERINARY MEDICINE, 45:375 [Sept.], 1950.) A printed report of the deliberations of this assembly will be available

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV), GREAT BRITAIN
MINISTRY OF AGRICULTURE AND FISHERIES

RETURN No. 24/1949. OUTBREAKS OF SCHEDULED (NOTIFIABLE) DISEASES WHICH HAVE BEEN CONFIRMED BY THE MINISTRY during the period

16*th* to 31*st* *DECEMBER*, 1949

Summary of Returns of outbreaks of certain scheduled (notifiable) diseases which have been confirmed by the Ministry during the period 16th to 31st December, 1949.

Period	Anthrax		Foot-and-Mouth Disease		Fowl Pest	Parasitic Mange*		Sheep Scab	Swine Fever	
	Outbreaks confirmed	Animals attacked	Outbreaks confirmed	Animals slaughtered as diseased or exposed to infection	Outbreaks confirmed	Outbreaks confirmed	Animals attacked	Outbreaks confirmed	Outbreaks confirmed	Swine slaughtered
Period 16th to 31st December 1949 ...	20	23	—	—	8	—	—	4	—	—
Corresponding period in 1948	8	15	3	133	8	—	—	5	—	—
Corresponding period in 1947	6	6	1	31	48	—	—	17	3	—
Corresponding period in 1946	4	4	13	1,070	—	—	—	2	2	2
Total 1st Jan. to 31st December, 1949	244	262	15	3,034	582	—	—	46	5	—
Corresponding period in 1948	118	128	15	1,592	267	1	1	69	27	5
Corresponding period in 1947	121	139	104	10,921	2,222	1	2	103	37	8
Corresponding period in 1946	95	98	54	5,642	—	7	8	94	347	208

NOTE.—The figures for the current year are approximate only.

* Excluding outbreaks in Army Horses.

NOTE.—The following diseases were eradicated from Great Britain in the years indicated :—Cattle plague or rinder-pest (*pestis-bovina*), 1877; pleuro-pneumonia (*peripneumonia contagiosa bovum*), 1898 ; sheep pox (*variola ovium*), 1850 ; rabies, 1922 ; epizootic lymphangitis (*lymphangitis epizootica*), 1906 ; and glanders (including farcy) (*malleus*), 1928. Dourine (*exanthema coitale paralyticum*) has never existed in Great Britain.

TUBERCULOSIS (ATTESTED HERDS) SCHEMES.

The number of Attested Herds, i.e., herds officially certified as free from Tuberculosis as at 31st December, 1949, was as follows :—

ENGLAND	WALES	SCOTLAND	TOTAL (GREAT BRITAIN)
18,838	13,818	12,233	44,889

Ministry of Agriculture and Fisheries,
12th January, 1950.

(675881) 900

soon from the Columbia University Press, New York City.

There has been great improvement in rabies vaccines in the past few years. The development of avianized rabies vaccine also constitutes another great improvement.

In South America the vampire bat maintains a pool of rabies infection and is the principal source of the disease in cattle. In some areas, such as the high plateaus of Columbia, cattle

Clinical diagnosis of rabies by an experienced veterinarian is more dependable than a diagnosis made by any other means, save animal inoculation.

not vaccinated annually against rabies are infected so frequently as to make the use of such ranges unprofitable, *i.e.*, the use of those ranges for cattle raising depends upon antirabies vaccination. In Africa, the mongoose serves to maintain a pool of rabies infection.

There is considerable evidence that some small nocturnal animal may serve as a reservoir of infection in the same manner in the United States. The evidence of this is particularly strong in Arizona and in Wisconsin and Minnesota. In both districts, skunks are rather frequently infected with rabies under circumstances that make it extremely unlikely they were infected by dogs, foxes or coyotes. The matter deserves investigation. The ground squirrel is a likely animal with which to begin the investigation.

Animals suspected of having rabies should be observed for a period of ten days. If the suspect is alive and well at the end of that period, the case is not rabies.

Rabies quarantines should be maintained for 90 days after the last case has appeared. Vaccinated dogs may be released from the quarantine safely, 30 days after vaccination. Exposed animals may be used for food up to one week after exposure and six months post-exposure. As the incidence of rabies is extremly high in herbivorous animals that have been bitten by a rabid animal, slaughter of such animals within a week should be given consideration as a conservation measure.

It should be required for the importation of dogs that they have been vaccinated within a 12-month period and they should be revaccinated as soon after importation as is practicable.

Antirabies campaigns should be conducted on a national or at least a regional basis. Smaller areas freed of the disease are readily reinfected from surrounding territory.

In the report of the Committee on Rabies, which followed the address by Doctor Johnson, the chairman, A. L. Brueckner, D.V.M., College Park, Md., expressed the opinion that a rabies vaccine which induces immunity for any period longer than one year but short of life, will introduce confusion into the antirabies program.

SIGNIFICANT OBSERVATIONS IN PULLORUM DISEASE ERADICATION

Abstract of a paper presented by H. Van Roekel, D.V.M., Ph.D., K. L. Bullis, D.V.M., M.S., G. H. Snoeyenbos, D.V.M., M. K. Clarke, B.A., M.S., O. S. Flint, B.S., Department of Veterinary Science, Massachusetts Agricultural Experiment Station, Amherst.

Losses from pullorum disease in this country have been reduced greatly through the adoption of reliable testing programs and effective eradication measures. However, to at-

tain further progress in the control and eradication of this disease, all states should scrutinize their methods of attack in order that more effective measures may be instituted.

An effective diagnostic dilution is essential in establishing and maintaining flocks free of pullorum disease. It should be recognized that infected birds may exhibit a wide range in agglutination titers. Testing results in Massachusetts for the past 23 years reveal that among 561 infected birds submitted for necropsy, from 334 flocks, 20.14% exhibited a titer of 1:80 or less. Approximately 1.5% of the 561 reactors had a titer of 1:20 or less at the time of necropsy. The results reveal that a 1:25 dilution is significantly more effective in de-

tecting infected birds than the 1:80 or higher dilutions. The 1:25 dilution has been gratifyingly effective in detecting infected birds especially in "break" flocks which often reveal only one or two infected birds; frequently with low titers. In regard to the whole blood test, one should also recognize that the blood and antigen dilution is important. A deviation from the amounts recommended may lead to faulty results and interpretations. Of the 561 reactors (confirmed on postmortem examination) two had a titer of less than 1:10; two had a titer of 1:10; four, 1:20; 31, 1:40; 74, 1:80, and the remainder had a titer of 1:160 or higher. A majority of the whole number of birds revealed a titer in the 1:160 to 1:1,280 range. That 113 (24.14%) had a titer of 1:80 or less is highly significant from a practical viewpoint. Obviously it is far less objectionable to remove a few noninfected birds than it is to leave even one infected bird.

The problem of the pullorum variant infection should be recognized. More knowledge about the seriousness of the problem would be obtained if diagnostic laboratories would type the cultures isolated from pullorum reactors or from diseased specimens received for examination. Bacteriologic methods should equal or exceed the minimum standards adopted by the National Poultry Improvement Plan. Furthermore, an improvement of antigens used for routine testing is apparently needed.

It is advocated that intensive retesting may be indicated in certain flocks, but that replacement with pullorum-clean stock is more effective in establishing flocks free of the disease.

The occurrence of "breaks" in pullorum-free flocks should not be ignored in a control program. During the past 20 years, 218 "breaks" (5.12%) were observed among 4,257 flocks tested. The percentage of infection on the first test for "break" flocks varied markedly. However, the majority of flocks revealed 0.5% or less. Over 50% of the 218 "break" flocks obtained a negative rating through retesting the same year that infection was detected. In the majority of "breaks" the origin of the infection could not be explained. It should be stressed that in the establishment and maintenance of pullorum-free flocks all phases of the disease must be recognized and the fullest cooperation from the owner, hatcheryman, and other agencies is essential.

Intensive Retesting

Eradication of pullorum infection from breeding flocks may be accomplished through short-interval testing. Hinshaw, *et al.*, first advocated testing infected flocks at four-week intervals until all infection had been eliminated. Through such a program of testing many clean flocks were established. The number of tests required depends upon several factors; (1) reliable testing method, (2) percentage of infection, (3) size of the flock, (4) environmental conditions, (5) adoption of a sound sanitary program, and (6) cooperation of the owner. Of these, the first is the most important.

An intensive retesting program is time-consuming and costly. It should not be started unless the owner has definitely decided to carry on the program to completion. Little or nothing is gained if the infection is reduced to one or two birds, as they may lead to heavy infection among the progeny the following year. It is the opinion of the authors that "in areas where pullorum disease is widespread a program of selective intensive retesting, plus extensive replacement of infected flocks with clean stock would result in the successful establishment and maintenance of pullorum-clean flocks." In New England, where there is little of the disease, owners of heavily infected flocks (2% or more) are advised to dispose of all their birds at the most opportune time and restock with birds from officially recognized pullorum clean flocks.

RECENT LITERATURE ON AVIAN PNEUMOENCEPHALITIS (NEWCASTLE DISEASE)

Abstract of a report presented by F. R. Beaudette, New Jersey Agricultural Experiment Station, New Brunswick.

This review of the literature, in essence, was a comprehensive summary of the vast amount of research on avian pneumoencephalitis, conducted in various countries all over the world, in 1949 and 1950. This painstakihgly compiled report is voluminous (40 pages of manuscript). Those interested in poultry diseases and poultry culture should possess it *in toto*. Here only the answers developed to some of the more important problems can be listed.

Avian pneumoencephalitis is widely distributed. It has been diagnosed on all continents and "in nearly every country" excepting the Latin American republics of which only Venezuela and Mexico have reported its presence.

The number of species, in which naturally occurring cases of the disease were diagnosed, were increased by finding it in a gannet, a starling and a partridge. Swine and sheep were shown to be insusceptible except to intracerebral inoculation and uncertainly invaded, even by that route. Two cases of the disease developed in man during the period covered by this report.

Tests showed Newcastle virus exposed to formaldehyde (70 cc. per 100 cu. ft.) was killed in two hours and in shorter periods by greater concentrations, solutions of liquor cresolis saponatis (1:400), formalin (1:50), tincture of iodine (1:100), potassium permanganate (1:100), sodium hydroxide (1:50), phenol (1:50), and merthiolate (1:1,000) killed the virus on 30 minutes' exposure. Ten gallons of formalin killed the virus in a heavily contaminated three-room building (5,500 cu. ft.) in 20 hours. The temperature of the rooms was 100 F.

In the examination of eggs collected from 50 hens for 109 days after vaccination with live virus, virus was detected in only three eggs.

The presence of pneumoencephalitis virus was established in feather mites of affected fowl, but none of the susceptible birds on which these mites were placed contracted the disease. It was concluded that mites *Liponyssus sylviarum*, harbor the virus only during the period of viremia in the host. Newcastle virus was isolated from a sample of commercial fowl pox vaccine.

It was concluded that carriers, if they exist at all in birds that have recovered from pneumoencephalitis, are so rare as to be "of no importance in view of the many more everyday sources of infection."

Thirty-two states have laws or regulations governing the interstate importation of poultry. In 20 states, the laws or regulations are general in application; in the remainder specific diseases are mentioned. The regulations are administered by a layman in one state, by laymen and veterinarians jointly in five states, and by veterinarians in the remainder.

Intrastate regulations for the control of disease in poultry exist in 38 states.

Thirty-four states request the use of vaccines. In 27 of these states, the regulations are administered by veterinarians, in four jointly by veterinarians and laymen, and in three by laymen. In nine states the use of vaccines is limited to veterinarians, in seven it is supervised by veterinarians.

From a long series of tests it was determined that duck plague, fowl plague, and pneumoencephalitis are unrelated diseases.

The importance of the airplane as a distributor of the Newcastle virus is indicated by the circumstance that the infection was transported to two countries during 1950, Holland and Venezuela, in shipments of birds by airplane.

INTRANASAL AVIAN PNEUMOENCEPHALITIS VACCINE AND ITS USE

Abstract of a paper presented by C. Bottoroff, D.V.M., L. B. Tennison, D.V.M., and Floyd Markham, V.M.D., Lederle Laboratories, Pearl River, New York.

Passively immune birds respond satisfactorily to intranasal vaccination against pneumoencephalitis (Newcastle disease). The preliminary work indicated no appreciable differences in the response of passively immune and nonimmune chicks. The studies were not conclusive as to whether chicks with a high degree of passive antibody responded to vaccination. It seems to be somewhat paradoxical that birds should be resistant to heavy intramuscular challenge with virulent virus and at the same time susceptible to upper respiratory infection and active immunization with a mild strain such as the Blacksburg strain of "Newcastle virus". It is postulated that a situation, parallel to that of human influenza, may prevail. It is recalled that circulating antibodies do not always mean immunity at the natural portal of entry.

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The reported growth-inhibiting effects of alfalfa meal are not important and need not concern feeders, except when such meal constitutes an extremely large percentage of the ration.—*H. C .Schaefer, Nutritionist, St. Louis, Mo.*

Nervous symptoms in young birds caused by infection with the virus of avian pneumoencephalitis (Newcastle disease).

INTRANASAL VACCINE: ITS ROLE IN AN AVIAN PNEUMOENCEPHALITIS CONTROL PROGRAM

Abstract of a paper presented by S. B. Hitchner, V.M.D., G. Reising, and H. Van Roekel, D.V.M., Ph.D., Department of Veterinary Science, University of Massachusetts, Amherst.

Continued observations on pneumoencephalitis (Newcastle disease) of poultry have shown that passive immunity cannot be depended upon to protect baby chicks. The control program, therefore, requires a means of

Dr. S. B. Hitchner

protecting the birds from the day of hatching until marketed. The low virulence of the intranasal vaccine permits its use in day-old chicks and in laying birds, thus filling the gaps left by the other live virus vaccines.

There is no claim by the authors that the intranasal vaccine is infallible and that it should replace all other types of vaccines. Its use has been recommended in baby chicks because of the urgent need for early protection. It is recognized, however, that there are factors of age, low virulence of the vaccine, and passive immunity which prevent obtaining the maximum degree of immunity in chicks.

The vaccine has been used to good advantage in laying flocks without causing a marked drop in production in the following circumstances: (a) for the immunization of laying flocks which have not been previously immunized but are threatened with infection at the time of initiating a live virus vaccination program in young stock; (b) for the immunization of laying flocks not previously vaccinated which are menaced by infection in nearby pens or premises; and (c) for the purpose of checking egg production losses in previously vaccinated flocks which suffer a "break" in immunity.

The effectiveness of the intranasal vaccine when administered to baby chicks should not be evaluated on the results of serological tests. According to such tests, only 33% of field vaccinated chicks were shown to be immune to the disease. The greater resistance to infection exhibited by intranasally vaccinated chicks may be attributed to the ability of vaccinated chicks to produce antibodies sooner than nonvaccinated birds. This increased ability to produce antibodies was demonstrated in 86% of the birds from field vaccinated flocks which were negative to the serological tests. Studies with the intranasal vaccine have led to the conclusion that the value of the vaccine should not be judged solely on the basis of humoral antibodies.

Comparative tests on the instillation of the low virulent virus used in intranasal vaccine have demonstrated the greater effectiveness of the intranasal route in contrast to the wing web or "stick" method of vaccination. The fact that this low virulent strain of virus does not give good immunity following the "stick" method may explain some of the failures for Newcastle disease protection in flocks vaccinated with the "stick" vaccines, as these strains are also of comparatively low virulence.

Since none of the vaccines in present use is perfect and all have certain limitations, it is believed that a control program can be carried out more effectively by the use of a combination of immunizing agents. In view of the limitations of products presently available, it is doubtful that durable immunity can be achieved, from day of hatching until marketing with one application of a vaccine. Efforts should be directed toward overcoming the deficiencies of the control program now followed by the use of a combination of vaccines; by improved methods of administration; or by continued search for strains of virus which will give greater protection with a minimum of reaction in the birds.

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At least two government agencies, the Bureau of Agricultural Economics and the Production and Marketing Administration, as well as a number of farm journals, are urging sheep herd increases. The nation's wool needs are dependent upon considerable expansion of the industry. The lack of shepherds and disinterest of livestock growers in sheep breeding are given as the primary reasons for decline in number during recent years.

A RESPIRATORY DISEASE (BRONCHITIS) OF QUAIL CAUSED BY A VIRUS

Abstract of a paper presented by Norman O. Olson, D.V.M., West Virginia Agricultural Experiment Station, Morgantown.

A respiratory disease, often fatal, occurred on the West Virginia State Game Farm among native bobwhite quail during the summer of 1949. The first hatch came off in April. Very little trouble was present from April to June, but by August 24, death losses of 80% were common.

Symptoms were first observed when the young birds were about three weeks of age. Feed consumption was reduced markedly at the start. There were coughing, sneezing, and rattled breathing, but no nasal discharge. The head was drawn back between the wings or held down between the legs in 2 to 3% of the affected birds.

Autopsy revealed no gross lesions except a thickening of the walls of the crop and cloudiness of the cornea in some, but not all, sick birds.*

The symptoms were noted to be similar to those of infectious bronchitis or pneumoencephalitis in chickens. A virus was suspected as the cause of the disease.

Mucus was taken from the tracheas of four quail and mixed with nutrient broth and streptomycin. This material was inoculated into the allantoic cavity of eight-day embryos. The allantoic fluid was harvested from the dead embryos, tested and found negative for Newcastle virus. Succeeding passages in embryos revealed a marked curling and dwarfing.

The pattern of growth in embryos suggested that this might be infectious bronchitis virus. However, inoculation of the third passage quail disease virus into chickens failed to cause noticeable symptoms in day-old and two-week-old chicks. A group of five-day-old chicks was also challenged and this virus was isolated from one that had a slight respiratory rale, seven days after challenge. Three weeks after the initial inoculation, these birds were exposed to a known bronchitis virus. Typical symptoms of bronchitis resulted.

These tests indicate that the virus isolated from quail is not the virus of avian pneumoencephalitis nor of infectious bronchitis. Although it was not evident in these limited trials, the possibility that cross immunity may exist between the quail disease virus and infectious bronchitis needs further investigation. Also, there may be types of virus in chickens, such as there are in human influenza, in which little or no cross immunity exists.

Inoculation of this virus into quail produced symptoms similar to the natural infection in four to seven days. Mortality in the artificially inoculated quail was slight. This suggests that the embryo-propagated virus might be useful as an immunizing agent.

The fact that the virus was isolated from one chick seven days after inoculation may indicate that this virus could be adapted to chickens under certain conditions.

*This would appear to be the same virus or one closely related to a virus reported some years ago from New Jersey by Beaudette.

INFECTIOUS SINUSITIS OF TURKEYS

Abstract of a paper presented by L. C. Grumbles, D.V.M., and W. A. Boney, Jr., B.S., D.V.M., M.S., Texas Agricultural Experiment Station and School of Veterinary Medicine, Texas A. & M. College, College Station.

Infectious sinusitis of turkeys is widespread in the United States and appears to be increasing in prevalence. The indications are it is due to a filtrable virus[1]. Reports on transmissibility vary. Some have failed and others have succeeded in communicating the disease by contact. Recent reports state that both streptomycin and aureomycin afford successful therapy.

Studies on egg transmission of sinusitis reached different conclusions, but the majority of investigators are of the opinion egg transmission does not occur. In the investigation of field outbreaks, the authors observed one in which there was strong evidence of egg transmission. They are of the opinion, however, that egg and hatchery transmission, if they occur at all, are rare.

The immunity developed by an attack of sinusitis is of a low order, easily overcome by intrasinus injection of virulent material, but is usually adequate to protect the birds from flock exposure.

[1]Noordsy, J. L., Infectious Sinusitis of Turkeys. *Vet. Med.*, 42:33 (Jan.), 1947.

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Vitamin B_{12} is the most important component of the animal protein factor (APF) but it is not the only one. There are probably two others, both of which are found in dried whey and to some extent in soybean meal, Vitamin B_{12} is needed for the growth of young chicks, pigs and poults, and for reproduction in chickens. It is not needed for egg production if the eggs are not to be used for hatching purposes (Bird, H. R., *Flour and Feed*, 50:12 (Dec.), 1949).

POULTRY GRADING AND INSPECTION PROGRAM OF THE U. S. DEPARTMENT OF AGRICULTURE

Abstract of a paper presented by W. D. Termohlen, Director of the Poultry Branch, Production and Marketing Administration, U. S. Department of Agriculture.

Twenty-five years ago practically all poultry came from the farms of this country, largely as a by-product of egg production. Today, nearly half of our chicken meat comes from

Inspected and graded

Inspected not graded

flocks maintained by special meat producers and more than half of the turkey meat comes from similar flocks.

Commercial broiler production in 1949 amounted to 487,000,000, seven times the average production for the five-year period 1935-39. In the same period, the tonnage of turkeys slaughtered has more than doubled.

Modern production methods resulting from scientific research and the practical application of these methods have resulted in the greater efficiency and economy of production which exists today. There is also greater recognition of the value of eggs and poultry meat in the human diet, and with improved marketing and merchandising technics these factors give indication that the poultry industry will expand still further in the years to come.

All of the developments and changes in the poultry industry during the past few years are important in the administration, planning, and revision of programs such as the poultry inspection and grading program. New developments must be kept in mind to modernize such programs. These programs should not be changed too often for the sake of good administration, and consequently it is necessary to anticipate possible future needs and requirements.

The USDA's new poultry inspection and grading program was developed after more than two years of study and conferences with individuals and groups representing every phase of the poultry industry and including officials of state marketing agencies. The new program supplants a program which has been in effect for more than 20 years and which had undergone some gradual change along the way.

In developing the new program, USDA officials believed that there were certain fundamentals which should serve as a basis, such as: (1) changes in the industry; (2) responsibility for minimum processing facilities and sanitary practices; (3) grading for quality and inspection for wholesomeness; (4) that a program must be voluntary because poultry meat, unlike beef, veal, pork and mutton, need not be federally inspected to be shipped or sold in interstate commerce; (5) development of a program which could be operated on a cooperative basis with official state agencies; (6) development of a program as practical, sensible, economical, and adaptable as possible; and (7) a program in which the interests and opinions of producers, processors, distributors, and consumers are considered.

There are three distinct new features in the recently adopted USDA poultry inspection and grading program. These features: (1) minimum requirements for sanitary facilities and procedures in all processing operations, (2) the grading of ready-to-cook poultry without federal inspection, and (3) the adoption of distinct and easily recognizable inspection marks and grade labels for use in connection with poultry processed under this program.

In the past, there were no minimum facility and sanitary operating requirements for slaughtering or dressing poultry as a prerequisite to grading and inspection. There were, however, requirements for the eviscerating process as a part of the inspection program. New program requirements mean that for both grading and inspection, plant operations must be conducted under prescribed minimum sanitary facilities and procedures.

In the past, many different terms have been used to describe poultry which was presumed to be ready for cooking without further preparation in the kitchen. It has been described as eviscerated, drawn, cut-up, ready for the pan, etc. In setting up regulations covering such poultry under the new program, it was felt that the term "ready-to-cook" would be more easily understood and would have sale value. Under previous regulations covering ready-to-cook poultry, there was graded and inspected poultry, and that which had been inspected only. For the first category there were licensed graders and licensed inspectors who handled grading for quality and inspection for wholesomeness. For the second category there were licensed inspectors who checked and passed

the eviscerated carcasses for wholesomeness, while the company utilizing this service was entirely responsible for the quality of the bird. Thus, in the previous program it was not possible to place an official government grade on eviscerated poultry which had not been federally inspected. Under the new program,

Examples of Official Identification for Dressed Poultry and Ready-to-Cook Poultry

Graded not inspected

eviscerated or ready-to-cook poultry may be processed for sale as an officially graded product without having been federally inspected.

The new program provides for four distinct grading and inspection services, namely; (a) grading and inspection of ready-to-cook poultry, (b) inspection of ready-to-cook poultry, (c) grading of ready-to-cook poultry, (d) grading of dressed poultry.

In developing and adopting inspection marks and grade labels for use in connection with the new program, steps were taken to adapt them to the convenience of consumers; consequently, the inspection marks and grade labels under the new program are the familiar circle and shield form used in stamping officially graded and inspected red meat. Labels in the form of a shield depict ready-to-cook or dressed poultry which have been officially graded for quality, and inspection marks in the form of a circle depict poultry which has been officially inspected for wholesomeness. A combined circle and shield label depicts poultry which has been officially inspected for wholesomeness and graded for quality.

Examination of the viscera of ready-to-cook poultry by a person approved or licensed by a state cooperating agency was considered as one step in developing the new program, before adopting the new regulations which under certain circumstances permit unofficial inspection and grading to be done by processing plant employees. It was found, however, that few representatives of state cooperating agencies were ready to accept responsibility for approving or licensing inspectors. The idea is still being considered, however, and in cooperation with several states it is hoped that within the next year practical demonstrations can be worked out to show how this plan can be applied.

Virginia has tentative plans for the training, licensing, and supervision of lay inspectors which may become the basis for practical experience along this line. It seems desirable to extend every effort toward working out a practical and not too expensive program for some type of official inspection of ready-to-cook poultry.

Approximately 1,900 poultry processing plants now exist, each of which is capable of handling a carload of poultry or more per week. Of this number about 1,400 have dressing facilities only. The remaining 500 plants have facilities for drawing or eviscerating, and of this number 125 have poultry canning facilities. August 1 this year, according to the poultry inspection service, there were 143 plants, including canning plants, that maintained federal veterinary inspectors. Aside from these various plants, there are many plants and many small dealer units which dress and draw poultry, and many buyers of dressed poultry who further process it. In view of this situation, it is not believed that industry or government should take the position that poultry should be handled and processed only in large, elaborate plants.

A member of the U. S. Livestock Sanitary Association has expressed the opinion that all poultry should be inspected for diseased condition and that such inspection should be conducted only by a competent, well-trained civil servant under supervision of a qualified veterinarian. The author agrees with this idea and asks how can it be done on a practical and wide-scale basis, when the hundreds of millions of pounds of poultry passing through market channels in dressed or ready-to-cook form are considered. The solution of this problem does not rest solely in the hands of federal agencies; however, and government officials are hopeful that it can be solved in the next few months by working with state cooperating agencies.

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Poultry constitutes the greatest reservoir of Salmonella infection in the United States. Investigation has disclosed an alarming incidence of salmonellosis in frozen, ready-to-cook poultry.—*Oscar Felsenfeld, M.D.*

PUBLIC HEALTH AUTHORITIES OBJECT TO FEDERAL POULTRY GRADING REGULATIONS

Notes from an address by Oscar Sussman, D.V.M., M.P.H., Senior Public Health Veterinarian, Division of Environmental Sanitation, State Department of Health, Trenton, New Jersey.

Most readers of this magazine are more or less aware of the radical changes in federal poultry inspection instituted by the Poultry Branch, Production and Marketing Administration, U. S. Department of Agriculture and effectuated January 1, 1950.

The change in the regulations were opposed by the U. S. Public Health Service, by all state public services that expressed themselves on the subject, and by the State and Territorial Health Officers Conference of which the health commissioners of all the 48 states are members. In a word, this change in the regulations of the Poultry Branch of the Production and Marketing Administration, USDA, may be said to have been unanimously objected to by every public health department in the country, on the ground that labeling, provided by these regulations for uninspected, evicerated poultry carcasses, is misleading and prejudicial to the interest and welfare of the consumers of poultry meat. Such veterinarians (not in the employ of the Poultry Branch) as had an opportunity to be heard at the public hearings on the proposed changes in these resolutions, protested their adoption on the more specific grounds that the labeling proposed for uninspected evicerated poultry is: (1) false and misleading and in violation of the Food, Drug and Cosmetic Act (Pure Food Law); (2) a fraud on consumers of poultry meat, in that it states on the label, "U. S. Grade A, Ready to Cook, Government Graded" when in fact an unknown proportion of such poultry meat is unfit for human consumption and prejudicial to the health of consumers, by reason of being diseased, in moderate stages of putrefaction or otherwise a disgusting product. But all protests were unavailing. The Poultry Branch officials at these so-called public hearings were utterly indifferent to all pleas on the part of consumers and the representatives of processors were contemptuous of the public interest.

In justice it must be stated that the large packers of red meat, who also operate poultry processing departments or separate poultry processing plants, took no part in these hearings. It was the poultry processing analogue of the proprietors of the oldtime slaughterhouse abomination, hidden back in the woods on the creek bank, who promoted these changes and when pressed for their reasons stated frankly that they wanted the USDA label as an aid to the sale of the product.

When representatives of the public health service proposed that the wording on the label be changed from "U. S. Grade A, Ready to Cook, Government Graded" to "U. S. Grade A, Graded for Quality but not Inspected for Wholesomeness," the processors objected that this wording would not help sales. The fact that such wording expressed the exact truth did not help its cause.

Doctor Sussman's paper was a formal presentation of the objections of health services for the record and covered ground familiar to most readers of this magazine. It should have a salutary effect on the Poultry Branch officials when other objectors to the new order are heard from, as they will be heard from in the future. The whole sordid affair is an attempt of certain poultry processors to obtain a free ride on the fine reputation that BAI meat inspection has built up over a half century for the purple stamp on meat. In this it has had the enthusiastic approval and unrestricted cooperation of officials of the Poultry Branch of the USDA, even to the extent of prostituting the USDA label to the status of a sales slogan for uninspected poultry meat.

One need not go outside the regulations for this new poultry meat labeling to find cause for condemning it. In one paragraph the regulations provide for labeling certain poultry meat "U. S. Grade A, Ready to Cook, Government Graded." In another paragraph they say the processor is solely responsible for wholesomeness of this product. That is just another way of saying the USDA disclaims all responsibility for the wholesomeness of poultry meat which it has officially labeled "Grade A, Ready to Cook." A far cry from the little "Purple stamp" that says: "Inspected and passed U. S. Department of Agriculture" and means it.

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Perosis in growing turkeys is a disease which is related to the metabolism of trace elements, particularly manganese and choline. Scott (*Jour. Nutrition*, 40:611, 1950) emphasizes the primary importance of choline in the prevention of this disease. In his work done at Cornell University, perosis was prevented if choline in the ration was maintained at a level of at least 850 mg. per lb. It was found that to be effective the diet must also contain an animal protein or a relatively high level of betaine or glycine and vitamin B_{12}.

Committee Reports

ANIMAL MORBIDITY AND MORTALITY

Notes from report presented by C. R. Schroeder, D.V.M., Chairman.

This committee has the most difficult task of any in the Association; also the most discouraging. As an offset it has the most persistent and resilient chairman. He is making slow progress against indifference that has heretofore proved insurmountable.

The available information on the location, amount and cost of disease and parasitisms among domestic animals in this country, is still pitifully inadequate, but it is greater than it was 30 years ago when the secretary of the Association first urged that such statistics be collected by the members and tentatively arranged for the publication of the reports monthly without expense to the Association. The attitude of the members of the Association is different than it was formerly. Then, some opposed the publication of disease incidence, a majority were indifferent. Now all favor it, albeit some but mildly.

The U. S.. Public Health Service collects and publishes weekly statistics on rabies in domestic and wild animals. Statistics published annually on bovine tuberculosis, indicate the amount of it and the location by states and the same information is somewhat sketchily available for bovine brucellosis and even more sketchily for swine brucellosis. Inference as to the amount of some other diseases can be drawn from meat inspection reports. So ends the story except for guesses.

A small appropriation for a central agency in the Bureau of Animal Industry and the Bureau of Agricultural Economics to assemble, classify and publish veterinary vital statistics, supplied by the states, seemed almost assured in the 81st Congress. Then the sudden warming up of the "cold war" and its insatiate demand for funds brought about a decision not to set up funds for new activities; not even as much as 1/20 of 1% of the $80,000,000. spent for unwanted potatoes.

The objectives of this committee, set forth in the 1949 report, were:

1. To secure the approval of the special request in the 1951 budget of the Bureau of Animal Industry, U. S. Department of Agriculture, for the establishment of a section on veterinary vital statistics.

2. To expedite publication and distribution of:

(a) A manual of animal disease nomenclature.
(b) A manual on the diagnosis and epidemiology of economic and transmissible diseases of animals.

3. To prepare practicing veterinarians and veterinary students, through all available means and agencies, to give complete reports to the chief livestock sanitary officials of their respective states on morbidity and mortality of domestic animals which come to their attention.

4. To continue to encourage support and interest in the program for gathering veterinary vital statistics. To this end, this committee recommended that colleges of veterinary medicine consider the incorporation of vital statistics in the curriculum to acquaint the veterinary student with the part that he will play as the initial source of morbidity and mortality data, to imbue him with his obligation, and to teach him to interpret and evaluate statistical data which will be made available to him as a result of his effort.

5. To secure support for its program, a request was mailed soliciting the opinions of 27 feed manufacturers, 53 directors of state agricultural experiment stations, 59 presidents of land grant colleges and deans of colleges of agriculture, 17 deans of veterinary colleges, 7 meat packers, 71 breed and grange associations, 48 farm bureau secretaries, and 20 manufacturers of pharmaceutical and biological products.

The replies received were interesting and informative. Practically all were encouraging. The president of a biological laboratory wrote that the collection, publication, and distribution of morbidity and mortality statistics is essential to the safeguarding of livestock interests.

The director of a farm cooperative wrote that veterinary vital statistics should result in lower losses from diseases, with resultant lower cost of production and lower prices to consumers. The transfer of funds from some of the extensive crop-supporting activities to projects, such as this, would be of longtime benefit to both farmers and consumers of farm products.

The director of an agricultural experiment station stated in effect that the benefit from such information would be manifold in giving direction to efforts in disease prevention and control.

A dean of a college of agriculture advised that their staff has long recognized the need for adequate vital statistics in the animal pathological field and are unanimously in favor of some project such as outlined.

A manufacturer of biological products stated that he and associates have given this matter no small amount of study for the past 25 years. It is both unwise and extravagant to spend millions for disease control without comprehensive data on the occurrence of the diseases.

The director of a state experiment station wrote: "A knowledge of the incidence, location and rate of spread of a disease is a necessity if adequate control measures are to be initiated before it is too late."

The president of a feed mill wrote: "We are not in favor of creating any additional agencies in the federal government. There are already 1,863 bureaus, agencies and administrations functioning in our government, employing 2,000,000 civilians compared with 600,000 before the war, *i.e.*, approximately 1,250,000 deadheads on the government payrolls. With the increasing need for more taxes for defense, we cannot consistently ask for more government spending. No greater service can be rendered our country than eliminating unneeded, wasteful, tax-absorbing agencies and conversion of those remaining to worthwhile tasks, such as your committee is endeavoring to establish."

The foregoing are but samples of a large number of letters all vouchsafing an interest in more information concerning animal disease. The letters from veterinary deans in particular are highly informing, but most of them are long and not readily abstracted for use at this time.

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Doctor Lash Retires from the BAI

Dr. Elmer Lash, Assistant Chief of the Tuberculosis Eradication Division, Bureau of Animal Industry, U. S. Department of Agriculture, 1917-1946 and since Inspector-in-Charge of the field service of the Bureau in Washington state, retired November 30, 1950 after spending 43 years in the government service. Doctor and Mrs. Lash will continue to reside in Olympia.

COMMUNICABLE DISEASES OF SWINE

Notes from report presented by L. M. Hutchings, D.V.M., M.S., Ph.D., Chairman.

Hog cholera continues the most destructive disease of swine in the United States.

All available studies on the variant virus indicate the disease it produces is still hog cholera.

In the light of present knowledge the best means of avoiding loss from the variant type

Dr. L. M. Hutchings

of hog cholera virus is to vaccinate the pigs before weaning. In swine vaccinated after weaning, the usual dose of serum should be increased 50%. The BAI is to be commended for its alertness in the matter of the variant virus.

The sentiment for the eradication of hog cholera is increasing. This committee recommends the appointment of a nation-wide committee to study this matter.

There is a need for better differential diagnosis of the inflammatory diseases of the gastrointestinal canal. Alkalizing preparations for the treatment of necrotic enteritis and other ineffective and misbranded products cost swine raisers a great amount annually.

"Baby pig disease" refers to a group of diseases affecting young pigs. It is indefinite and the use of this term to indicate an ailment of pigs should be discontinued.

Research in swine disease has not received its fair share of appropriations in the Corn Belt states. In that area, swine are responsible for one-third of the income from all livestock. Much less than one-third of the appropriations for disease research is earmarked for diseases of swine.

The prospects are good that improved hog cholera vaccines will be available soon.

FOOT-AND-MOUTH DISEASE

Notes from report presented by H. F. Wilkins, D.V.M., Chairman.

This committee reported little change in the foot-and-mouth disease world situation during the year except in Mexico and Venezuela. The disease continued enzootic in most countries. In the first half of 1950, a virulent type of the disease spread widely in Africa; five new outbreaks occurred in Denmark, 14 in Britain and a number in Switzerland. All were quickly eradicated. Food sent from France to French occupation troops in Australia was responsible for adding one outbreak to the ample infection already there.

The outbreak in Venezuela was expected, since the importation of both cattle and fresh beef from Brazil is permitted by the Venezuelan government. Columbia is now the only country in South America in which foot-and-mouth disease is not enzootic. No cases of foot-and-mouth disease occurred in Mexico during the year.

After four months of continuous effort the type A virus in Mexico was induced to grow on tissue according to the method of Frenkel. If it should be necessary to resume the production of vaccine, it is hoped it may be made from virus grown on tissue culture and thus reduce the cost of the vaccine to a small fraction of cost of that produced from inoculating livestock. A close watch for new cases of the disease in Mexico will be maintained for many months.

To this reporter, the success of mass vaccination in reducing the amount of the disease to manageable proportions is a convincing demonstration of the value of this method of disease control and eradication. This is probably all of value that was learned from the outbreak in Mexico and that was already generally but not universally known. In Mexico, the vaccination program was undertaken when slaughter and quarantine had failed completely and the situation looked hopeless.

At this time, when it is possible and seems probable that the four-year-old outbreak in Mexico has been eliminated, it is worth while to review briefly the sequences leading to this hopeful situation.

Foot-and-mouth disease was probably introduced into Mexico by imported Brazilian cattle in the summer of 1946. It was not recognized until December of that year. Arrangements for joint action against the disease, official authorization and assembly of equipment in Mexico, delayed active measures against the disease until near the end of April 1947. An estimate of the situation at that time indicated 5,000,000 animals would need to be slaughtered to extirpate the disease. It was cockily announced that "'no vaccine or alleged remedies" nor temporizing measures would be tolerated in Mexico. Then followed seven months of total slaughter mania, at the end of which a survey pronounced the task three times as great in November as it had been in April, *i.e.*, 15,000,000 then required slaughtering. Mexico could go no further, without ruining her cattle industry and injuring her national economy. The total slaughter method was perforce abandoned. It would be gratifying to say the slaughter plan was abandoned because of its demonstrated failure, but such was not the case, the change was forced upon the experts.

When one must, one must, and measures to employ vaccination were begun; 1,750,000 doses of vaccine were purchased in Europe and South America. No more was to be had. Fifty million doses would be needed. Laboratories were built to produce the vaccine in Mexico. Five months later or in May 1948, a few thousand cattle were vaccinated. It was not until October that as many as 1,000,000 animals were vaccinated in a single month.

No estimate of the size of the task then confronting the joint commission is available, but from the summer of 1948 when General Johnson became codirector of the Mexico-United States Joint Commission until July 31, 1950, the vaccination of animals in the infected area was prosecuted with the utmost vigor. In the 21 months, more than 60,000,000 doses of vaccine were used. July 31, 1950, vaccination was discontinued and the stock of vaccine on hand destroyed. Since all animals within the quarantined area were immune when vaccination was discontinued, it is necessary to wait four to six months till they lose their immunity before it can be determined whether or not residual infection still persists in the area. Whatever the outcome, the fact remains that after the disease was allowed to spread for two years, it was suppressed in 18 months by vaccination.

Reverting to the committee report; the cost, to the United States, of the work of the Mexican-United States Joint Commission for the eradication of foot-and-mouth disease was in excess of $120,000,000. to September 30, 1950. This probably did not include the value of a vast amount of equipment supplied to the commission by the U. S. Army, including the bulldozers, power shovels, entrenching machinery, armored pay cars, mobile machine shops, and unnumbered jeeps and trucks and automobiles

from Chevrolets to Cadillacs. It is also probable it did not include the loss on millions of pounds of canned meat purchased in Northern Mexico by the U. S. Commodity Credit Corporation at 50% above the market price and sold at a corresponding loss. The committee report was not clear on these matters.

Vaccination reached its highest point in January 1950 when 5,052,611 animals were vaccinated. As of November 1, 1950, no new cases of foot-and-mouth disease had been diagnosed since December 1949. The number of suspected cases reported in which laboratory tests were made, numbered 219. Of these, 81 were the New Jersey type and 17 of the Indiana type of vesicular stomatitis. In many other cases a clinical examination excluded foot-and-mouth disease.

The border patrol was commended as being efficient, effective and adequate, as was also the watchfulness of the Bureau of Animal Industry, USDA and the Health of Animals Branch of Canada at coastal ports.

BIOLOGICAL AND PHARMACEUTICAL PRODUCTS

Notes taken from committee report presented by S. F. Scheidy, D.V.M., Chairman.

Licenses for the manufacture of the following new biological agents were issued during the past year:

1. Avianized rabies vaccine (vacuum dried).
2. Normal canine plasma (desiccated).
3. *Clostridium chauvei-septicus* pasteurella bacterin.
4. Newcastle disease antigen.

Licenses were discontinued for the manufacture of the following biological agents:

1. Bronchisepticus-bacillus bacterin
2. *Clostridium chauvei-novyi* bacterin.
3. *Clostridium chauvei-welchii* bacterin.
4. *Listerella monocytogenes* bacterin.
5. Johnin.
6. Antiencephalomyelitis serum (all types).
7. Swine erysipelas antigen.
8. Botulinus toxoid (A & B types).

On order of the BAI the distribution of desiccated *Brucella abortus* vaccine (strain 19) in multiple dose containers was discontinued.

Three new chemical agents were released during the year for the prevention of coccidiosis in chickens. They are nitrophonide, nitrofurazone, and 2'-methylene-bis-(4-chloro-phenol). They are used in the same manner as sulfaquinoxaline.

Two new compounds, 2 amino-5-nitrothiazole and 2 amino-5-nitropyrimidine, appear to have value in the management of enterohepatitis (blackhead) in turkeys.

It was demonstrated during the past year that hyaluronidase increases the rate of absorption of sera, saline solutions, dextrose-calcium solutions, antibiotic agents, etc., when these agents are injected subcutaneously.

The Food and Drug Administration secured judgments during the past year against 25 producers or distributors of misbranded or worthless products for the use of livestock owners. Two of these products were an alkalizing agent for the treatment of necrotic enteritis of swine and a wheat germ oil for the treatment of infertility in farm animals.

PARASITIC DISEASES

Notes from report presented by Benjamin Schwartz, Ph.D., Chairman.

The report of this committee was limited to a consideration of ectoparasites of cattle, sheep

Dr. Benjamin Schwartz

and swine. Extensive trials of area control measures for cattle grubs (ox warbles) are under way in Washington, Colorado, South Dakota and New Mexico by the Zoological Division, Bureau of Animal Industry, USDA, in cooperation with the livestock authorities of those states. The experiment will be continued for two more years.

In 1900, sheep scabies was a serious threat to the sheep industry of the western states. Since 1915 good progress has been made in the eradication of this disease, but considerable infection remains. Lime and sulfur and nicotine dips are the only ones officially recognized. Benzene hexachloride (BHC) is more effective and safer, but is not easily controlled under field conditions.

In an experiment conducted in New Mexico, scabies was eradicated from a band of 10,000

infected sheep in 1949 by a single dipping in a BHC suspension. No case of scabies has developed in these sheep since. The sheep suffered not the slightest ill effect from the dipping. Settling of the insoluble powder is a great disadvantage of BHC dip.

In western South Dakota, 8,000 sheep infected with scabies and 6,500 exposed sheep were treated with BHC with complete success.

Psoroptic mange in cattle is becoming scarce, but the chorioptic and sarcoptic varieties are spreading.

Two sprayings, 12 days apart, eradicated the parasites in psoroptic scab or mange in cattle. Another herd was cleaned by a single spraying with a suspension of BHC.

The pure gamma isomer (lindane) was used in a New York herd suffering from chorioptic mange. Two treatments eradicated the parasites.

Final conclusions cannot be drawn as yet, but it appears that, in cattle, four treatments with BHC are required for sarcoptic mange.

A preparation of 12 parts BHC and five parts zylol destroyed all spinose ear ticks in the ears of an infected herd and prevented reinfestation for 70 days.

Mange in swine occurs everywhere, but is most prevalent in the Corn Belt. BHC spray in a concentration of 0.125% is both a safe and an effective treatment.

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RING TEST FOR BRUCELLOSIS

The ring test for brucellosis is not only a quick and inexpensive way of locating infected herds among the patrons of a creamery or fluid milk plant, but is also a surprisingly effective way of obtaining the cooperation of the owners of infected herds in other measures for the elimination of the infection from the herd.

When told that the test of his milk indicates infection in some members of his herd and advised not to use the milk for his family till he can have his cows blood-tested, the average dairyman fairly clamors for the agglutination test.

Actually finding evidence in the milk that something is wrong in his herd is more effective than a dozen educational pamphlets about brucellosis.

He doesn't know much about blood, nor care materially, so long as the cows appear well and produce satisfactorily. But he is an expert on milk and impressed by any abnormality found in it.

ANAPLASMOSIS

Notes from report presented by L. T. Giltner, D.V.M., Chairman.

The first outbreak of anaplasmosis in Minnesota was reported during 1950. The disease has now been reported from 30 of the 48 states. Many outbreaks were reported during the year from various states, some of these outbreaks occasioned much loss.

Practitioners quite generally treat anaplasmosis, but treatment is ineffectual.

Typical attitude in anaplasmosis. Accumulating evidence indicates increased incidence of this disease.

Postmortem reports of federal meat inspectors indicate the comparative prevalence of the disease in different years. In 1947, 429 carcasses of cattle were condemned for anaplasmosis; in 1949, 428 and in 1950, 529 carcasses were condemned. These animals, it is presumed, were in incubative stages of the disease at the time they left the farm or range.

Convalescence from an attack of anaplasmosis is long, usually several weeks or months in duration.

All states in which the disease occurs should prepare maps showing the location of reported cases, at least by counties and preferably in greater detail.

Considerable interest is being shown in the complement fixation test as an aid in the diagnosis of this disease.

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Q fever is described as a specific disease of man. It is resident in nature as a nonapparent infection in animals. Source of infection in sheep, goats, and cattle may be transmitted by contact, consumption of raw products derived from these animals, or by air. Investigational work now in progress is expected to throw more light on the subject.

Surital Sodium: A New Agent For Intravenous Use

W. O. BRINKER,*, D.V.M., M.S., F. E. EADS,* D.V.M., M.S., E. K. SALES,* D.V.M., R. G. SCHIRMER,* D.V.M., A. C. WHEELER,* D.V.M., East Lansing, Michigan

THE two most common barbituric acid derivatives used in small animal surgery thus far are pentobarbital sodium and pentothal sodium. Their chief shortcomings are respiratory and circulatory depression, inadequate muscular relaxation, and occasionally protracted postoperative sleep. The clinician and surgeon are always interested in new derivatives which may more nearly approach the ideal anesthetic.

The use of surital sodium† was first reported in veterinary publications by Reutner[1]. Wyngaarden, *et al.*,[2] found that it produced an equally smooth and perhaps more rapid induction of anesthesia than pentothal with fewer signs of excitement and a more rapid recovery. Woods, *et al.*,[3] demonstrated by their experiments that in equivalent doses, surital is perhaps less, but definitely not more toxic than pentothal. A preliminary clinical evaluation of the intravenous anesthetic in 1,200 human cases was reported by Helrich, *et al.*[4].

Clinical Methods

Sterile physiological saline was used as the solvent. Twenty-five cubic centimeters of sterile physiological saline was added to 1 gm. surital sodium, making a 4% solution. This dilution was chosen so that the amount injected would correspond with the recommended average dose of pentobarbital (1 cc. per 5 lb. of body weight). Five per cent glucose solutions are not recommended as solvents since a cloudy precipitate forms on standing. The preparation was mixed, stored, and injected at room temperature. The solution has been kept up to ten days without apparent loss of potency or change in appearance.

The intravenous route was used as the method of administration. In some of the cases the solution was injected slowly over a period of three to five minutes; in others the first half of the dose was injected rather rapidly and then the remainder given slowly to effect. No premedication was administered.

The canine patients ranged from five weeks to 16 years of age. All degrees of surgical and anesthetic risks were included in 180 patients.

Clinical Uses

Restraint is always a problem and one hesitates to use a long-acting anesthetic to accomplish an objective requiring only a few minutes if the animal can be handled properly. Surital has been found to be a very definite aid in solving this problem. This anesthetic has been used in accomplishing the following: removal of neoplasms, extraction of teeth, making radiograms, tissue biopsy, readjustment of pin splints, application of casts, application of modified Thomas splints, removal of vocal cords, treatment and suturing of wounds, removal of membrana nictitans, cleaning teeth, treatment of otitis, ovariectomy, relaxation of the abdomen so one can do a more thorough palpation examination, removal of dew claws, castration, amputation of tails, dressing of painful skin conditions, lancing abscesses, removal of foreign bodies from the esophagus and stomach, tonsillectomy, reduction of dislocations, operative repair of hernias, and entropion operations.

It has also been used as an anesthetic in performing major surgery, however, in these cases the animal must be given additional amounts during the progress of the operation. This is given intravenously and to effect.

Observations

In the large majority of cases, the dogs made little or no objection during the period surital was administered, less than 3% showing any excitement during the induction period. In all cases, this was relatively mild and of short duration. The incidence of postoperative excitement, which was mild and of short duration in most cases, was approximately 5%.

In practically all cases, surital markedly stimulated the flow of saliva. This was found

*Michigan Agricultural Experiment Station, Department of Surgery and Medicine, East Lansing. Journal article no. 1190.

†Surital sodium supplied by Parke, Davis & Company, Detroit, Mich.

to be somewhat objectionable in performing operations of the throat; such as removal of vocal cords. The reaction can be effectively controlled by administering atropine prior to giving the anesthetic.

Complete muscular relaxation was found to be one of surital's shortcomings as an anesthetic. However, in all cases it was found to be adequate for procedures listed under clinical uses providing it was administered slowly until relaxation was accomplished.

Emesis did not occur in any of these cases. Six cases exhibited a mild sneezing reaction.

When the dog was placed under light plane anesthesia using the initial injection only, postoperative recovery started in an average of about ten to 20 minutes and was complete in approximately one-half to one hour. When the animal was kept under surital anesthesia for a longer period of time, by giving continued or repeated injections, the postoperative recovery period was definitely delayed; ranging from one to three hours or longer.

In most cases, the anesthetic dose was approximately 1 cc. per 5 or 6 lb. body weight. The dosage very closely followed that of pentobarbital sodium for the same animal. Two exceptions occurred in Chows weighing about 60 lb. each and three to five years of age. Three cubic centimeters each produced sufficient anesthesia to perform the operation for correction of entropion. As with other barbituric acid derivatives older animals and those in poor physical condition required less surital to produce anesthesia. In these cases the solution was injected slowly to effect.

All surital was given intravenously in clinical cases, no local reactions appearing at the site of injection. In five experimental cases, 2 cc. amounts were injected into the tissues surrounding the cephalic vein. One cat showed a mild swelling which disappeared in two days, two dogs exhibited a mild local reaction, and two resulted in a marked swelling of approximately one inch in diameter. These reactions resulted in a slough of about one-half inch in diameter.

Surital was administered intravenously to five cats. Anesthesia was smooth, rapid and without signs of excitement. Three exhibited signs of returning consciousness in about ten to 15 minutes and were completely conscious in 90 minutes. The remaining two exhibited a more protracted sleep; one recovering in three hours and the other requiring approximately 26 hours.

One death occurred. This was in an English Bulldog. The animal was a poor anesthetic risk physically and had a congenitally malformed and constricted glottis and trachea. The animal died of suffocation in light plane anesthesia due to the increased secretion of fluids in the presence of the extensive stricture.

In several cases the surital sodium solution was used to accomplish euthanasia. Twice the approximate anesthetic dose injected rapidly accomplished this objective.

Summary

Clinical use of surital sodium as an intravenous anesthetic on 180 cases is reported.

Indications and observations following its use are discussed.

Results indicate that if used with caution it is an anesthetic with a relatively high margin of safety, that it produces a minimum of induction and postoperative excitement, and that a minimum amount of circulatory and respiratory depression are produced in dogs.

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It is extremely difficult to realign a femoral fracture if it is allowed to go untreated for 24 hours. Callous formation is apparent three days after injury, and if the fracture is not reduced before five to six days, surgery is required to break down the callous formation. For these and other reasons, H. C. McDonald, Jr., M.D., emphasizes the importance of early treatment of femoral fractures.

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No reports of leptospirosis in cats were found on limited search of veterinary literature. The opinion of a number of practitioners is that cats are not susceptible to Leptospira. It has not been observed even in widespread outbreaks among dogs where there was opportunity for mass exposure.

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Photosensitivity has been observed in patients treated with antibiotics.

Merry Christmas and a Happy New Year

Procaine Penicillin

Penicillin in the culture media in which it is produced occurs as a free acid. This acid may be combined with a number of alkaline substances to form salts. A number of these salts of penicillin have been used, beginning with calcium. Potassium and sodium penicillin have been used and all three are characterized by instant solubility in water. Procaine penicillin, the latest salt, has the property of being very slightly soluble in water, aqueous solutions or body fluids. The chemical bond between the procaine molecule and that of penicillin is strong and is broken only as the penicillin is absorbed from the molecular combination. At this point of molecular breakdown, procaine is also liberated.

The anesthetic effects of the combined procaine are slight, primarily due to the fact that it is liberated at an extremely slow rate, and as a consequence, exerts little influence. The procaine portion of this combination was not chosen because of the anesthetic properties of procaine, but because this particular salt is practically insoluble in water and, when injected, the salt acts as a reservoir of penicillin which is released from its combination slowly. Because of its insoluble nature, procaine penicillin has met the requirements for giving sustained blood levels of the antibiotic without the necessity of frequent administration.

Aluminum monostearate, when added to these crystals of procaine penicillin, exerts a water-repellent effect which decreases intimate contact between tissue fluids and the antibiotic crystals, thus still further extending the absorption time of penicillin in such a vehicle.

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Dr. W. W. Armistead, College Station, Tex., applies the term "tailoring" in referring to the closure of surgical wounds. Edges must be brought into a position so as to "fit" and pockets and cavities must be eliminated. The surgeon is rewarded by lessened healing time when these principles of good tailoring are applied.

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A favorable hog-corn ratio of 14 was posted for September and will remain favorable for hog production for at least the next six months, according to agriculture economists.

Halogeton Poisoning

"Buzzards, crows, and other scavengers gorged themselves on the carcasses of rangeland sheep dead of halogeton poisoning in half a dozen western states," reports *Newsweek*, December 4, 1950.

This new poisonous weed known scientifically as *Halogeton glomeratus* (see VETERINARY MEDICINE, 45:419 [Oct.], 1950) has been thriving since 1935 when first reported in Nevada on the semi-arid plains of this state and Utah, California, Wyoming, Montana, Oregon, and lately has been reported in Colorado. An annual, the plant is frequently mistaken for Russian thistle (tumbleweed). Seeds are winged, and winds of the regions are responsible for its rapid spread.

Dr. Ward T. Hoffman, poison plant specialist of the USDA, estimates that the weed has sprung up on 50,000 acres of grazing land and in some sections it occurs as solid stands. The poisonous principles are oxalates; enough are contained in 1.5 lb. of the plant to kill adult sheep. Oddly, the plant appears to be quite palatable for both cattle and sheep. The action of the poison is to draw calcium from the body to form calcium oxalate to deplete the calcium content of tissue fluids. Animals develop paresis, which is followed by coma and death.

No antidote is known. It has been pointed out that losses from other plant poisons dropped with education in identification. Notable examples are sheep losses due to larkspur and horsebrush weed. Ranchers are urged to learn to recognize the plant and avoid ranges where it has become established. Plant poisons, burning, and blading, followed by reseeding with hardy, native plants now appear to offer the most practical solution to control livestock losses.

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The statement made regarding the establishment of the office of State Veterinarian for West Virginia, which appeared on page 428, October issue of VETERINARY MEDICINE was in error. The West Virginia Veterinary Medical Association is sponsoring a practice act but this act does not include any provision whatsoever for the establishment of a state veterinarian's office. In this state, the Commissioner of Agriculture delegates livestock sanitation to a veterinarian who, after appointment, functions as the State Veterinarian.

Misuse of Lindane Sprays

Misuse of lindane sprays for control of flies has caused death of livestock, according to the California State Department of Agriculture.

Three cases of such injury have been reported to the state office. In each case, the user had not followed directions on the label, but had applied an excessive concentration of the spray directly to the animals.

Lindane sprays may be used at relatively high concentration for coating barn walls and other such surfaces to provide a residual deposit. They may also be used at a much more dilute strength for direct application to livestock. Young animals are especially sensitive to the chemical, and lindane sprays have injured calves.

According to the recommendations of the USDA, sprays for treatment of barn walls and similar surfaces should contain 0.25%. Such a concentration would be obtained by using 10 lb. of a wettable powder containing 25% lindane to each 100 gal. of water.

The dilute spray to be used directly on the livestock for control of ticks and lice should contain only 1/10 of this amount or 1 lb. of the wettable 25% material per 100 gal. for a concentration of 0.025%.

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Characteristics of Viruses

Viruses have been known to medical science for only 58 years. In 1892, Ivanowski reported that a filter-passing agent was responsible for tobacco-mosaic. Foot-and-mouth disease, the first animal disease ascribed to a virus, was reported by Loeffler and Frosch in 1898.

Since 1898, a large number of virus diseases have been described. The characteristics of these are now defined in the positive sense as information is accumulated. The general characteristic of a virus is that it is small and below visibility of the ordinary microscope; its metabolism is closely associated with living cells; it is cell specific; it is antigenic; and, finally, it tends to variation in one or more characteristics.

The infective unit of virus is referred to as an elementary body and may be thought of as an analog to a bacterial cell.

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Shock and sepsis constitute the two most dangerous deterrents in surgery.—*W. W. Armistead, D.V.M.*

Dr. Leslie M. Hurt Honored

In honor of his more than a quarter-century of valued service as head of the Los Angeles Livestock Department, Dr. Leslie M. Hurt was honored at a testimonial banquet held at the Hollywood-Roosevelt Hotel on November 20, 1950. His official retirement will date from December 1.

DR. L. M. HURT

Doctor Hurt became County Livestock Inspector in 1913, after serving for one year as City Veterinarian of Pasadena. He was named to head the Los Angeles County Livestock Department when that unit was formed in 1924. His leadership in organizations associated with the livestock industry and veterinary medicine are well known to readers. He served as president of the A.V.M.A. for 1948-49.

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Protein Consumption of Beef Cattle Controlled With Salt

Mixing salt with cottonseed meal offers ranchers a way to self-feed controlled amounts of protein supplement to their beef cattle. USDA workers at the Southern Great Plains Field Station, Woodward, Okla., found that they could closely control the amount of cottonseed meal cattle would eat by regulating the amount of salt mixed with the meal.

In their experiments, self feeding meal saved all of the work of hand feeding; the cattle ate more nearly the meal that they needed, and they ate it at their leisure.

Winter feeding weaner calves the 2 lb. of 41% crude protein meal they needed daily was accomplished by mixing 0.5 lb. of salt into every 2 lb. of cottonseed meal. As the calves got used to the mixture and ate more of it, the salt in the mixture had to be increased to maintain correct meal intake.

PRINCIPLES OF ANIMAL HEALTH

R. R. DYKSTRA, D.V.M.
Manhattan, Kansas

A recent report by the U. S. Bureau of Dairy Industry indicates that in regard to mastitis in the Bureau's herd of 341 infections, 10.56% were due to *Streptococcus agalactiae;* 43.99% due to other streptococci; 30.79% showed hemolytic staphylococci; 4.4% coliform bacteria; 7.62% pseudomonades; 2.64% yeast and cocci. Four infusions of penicillin dissolved in sterile water, were injected for two consecutive days; one each as shortly as possible after the morning and afternoon milking. An average dosage of 200,000 units at each infusion seemed most beneficial. More than a total of four infusions were without benefit. The infused material was thoroughly massaged throughout the gland tissue, and was not removed. When applied during the incipiency of the infection, and combined with due regard for sanitary principles, the treatment was 97.22% effective in 36 *Str. agalactiae* infections, and 89.26% in 149 other streptococcal infections; 85.44% of 103 staphylococcal infections; 93.33% of 15 coliform infections; 76% of 25 pseudomonadal infections and 87.83% of 337 infections of all kinds. The high degree of effectiveness, it is indicated in the report, is probably in a measure due to the detection of the infection before clinical mastitis manifested itself.

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In England the "Docking and Nicking of Horses Act" makes it illegal to dock or nick horses unless it is officially certified that the "operation is necessary for the health of the horse because of disease or injury to the tail." It is furthermore recorded that "after January 1, 1955, no docked horse coming from outside the United Kingdom can be imported unless permission is given by an officer of Customs and Excise or licensed by the Minister of Agriculture."

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The diagnosis, it seems to us, of distemper-like ailments in dogs is becoming increasingly difficult from the standpoint of differential diagnosis. The clinician must now distinguish between (a) distemper due to the virus of Laidlaw and Dunkin; (b) hepatitis contagiosa canis; and (c) hard-pad disease.

Agents that may be used in chemical warfare are those classified as nerve gases. These are odorless, colorless liquids that emanate toxic vapors on evaporation. Their action depends on the degree and extent of exposure, varying from such mild symptoms as pinpoint pupils, watery nasal discharge, and paroxysmal constriction of the bronchioles to severe bronchospasm, inhibited inhalation and exhalation, cyanosis, unconsciousness and death. The entire condition is said to be due to irreversibly inhibiting the enzyme cholinesterase. Recommended treatment in early cases is atropine sulfate in rather large, repeated—every few minutes—doses. In profound collapse, atropine may be dangerous in setting up cardiac fibrillations and death. Artificial respiration is advised for these advanced cases. Splashing of the skin with liquid nerve gas is best treated by blotting—no rubbing—with an alkaline solution, or even with water.

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It was informative to learn from a foreign publication that in Czechoslovakia, bull's semen can be as effectively diluted for artificial insemination purposes by means of boiled filtered cow's milk as when more complicated buffer formulas are used. The dilution may be from one part of semen to two parts of milk up to one part of semen in 25 parts of milk. If stored at 32 F. to 36 F. sperm remains viable and potent for 120 to 160 hours.

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The fact that some synthetic, odorless, colorless compounds are effective insect repellents is a war-time discovery. They include dimethyl-phthalate, dibutyl-phthalate, 2-ethylhexane-diol-1, and others. Unfortunately they do not seem to be of practical value in their use on animals as their repellent effect wears off in a few hours, necessitating reapplication.

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The most nearly correct rectal temperature in pigs is found approximately six inches anterior to the anus. The average is somewhat over 102 F. The minimum may be as low as 97.2 F., with a maximum of over 106 F.

POULTRY PRACTICE PROBLEMS

W. R. HINSHAW, D.V.M., Ph.D.
Frederick, Maryland

In a series of three papers, Kennard and Chamberlain (*World's Poultry Sci. Jour.*, 6:177, 1950 and Proc. 39th Ann. Mtg. Poultry Sci. Assn., 1950) have summarized their research work on floor litter management as a factor in poultry nutrition and mortality, which has been in progress at the Ohio Agricultural Experiment Station since 1944. Their researches indicate that synthesis of growth promoting and certain sanitizing properties can be realized from the chemical and biological activities in old built-up litter. Their findings tend to upset previous recommendations that frequent changes of litter are necessary to prevent disease transmission. The investigators themselves are the first to admit, however, that their results are contrary to previously established sound management practices, and to quote them: "The improvement in growth and the reduction in mortality observed in groups of chickens raised on old built-up litter indicate the urgent need for fundamental research relative to the chemical and biological processes (and their products) that take place."

We should not be too hasty in throwing aside our old recommendations because of the Ohio findings, but should wait until their findings have been verified by other investigators under a wide variety of conditions. It certainly is of interest, however, that under the Ohio conditions, losses from coccidiosis and other diseases were reduced from an average of 19% in pens where the litter was removed at frequent intervals to 7% in pens where the same litter was used as had been used previously for four to seven consecutive broods of chicks.

One can only guess at what accounts for this fact, but one theory is that antibiotic effect of microbial growth in old built-up litter may be detrimental to the coccidia and other infectious microbes present in the litter.

It is now generally agreed that two of the nutritional factors responsible for increased growth in birds reared on old built-up litter are riboflavin and vitamin B_{12}. Holbrook, Winter and Sutton (Proc. 39th Ann. Mtg. Poultry Sci. Assn., 16:1950) have made microbiological assays of built-up litter and have shown that it contains an average of 250 micromilligrams of B_{12} per gm. as compared to 1 micromilligram of B_{12} per gm. in unused litter controls. Autoclaved built-up litter proved more effective in stimulating growth than did unautoclaved litter.

Raw potatoes, either sun dried or oven dried, are not a satisfactory feedstuff for growing chickens or turkeys. Dried, cooked potatoes may, however, be fed at a 20% level in turkey and chicken rations. The cost of cooking and dehydrating potatoes is so expensive that unless they can be obtained at low cost, it is not profitable to use them as a feed supplement. (Kratzer, *Calif. Agr.*, 3:15, 1949.)

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In trials conducted at the South Carolina Agricultural Experiment Station, the administration of sulfamerazine to pullorum reacting breeder hens failed to provide any dependable control of the disease. Chicks hatched from eggs laid by these hens were found to be highly infected with pullorum disease. (61st Ann. Rept., S.Car.Agr.Exp.Sta., May 1950.)

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Castor bean oil meal is extremely toxic for chicks, either when fed raw or after steaming for 15 minutes, according to Borchers (*Poultry Sci.*, 28:568, 1949). Autoclaving or treating by 95% ethanol refluxing destroys the toxic principle but the resulting product fails to give normal growth to chicks. Repeated extraction with 95% ethanol did, however, result in a product which gave normal growth to chicks.

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Sulfamerazine administered in the feed at a 0.5% level will seriously reduce egg production in pullets, but a 0.25% level may be used in the feed for several weeks with no ill effects on egg production, or on percentage hatchability of the eggs.—Riedel, *Poultry Sci.*, 29:621, 1950.

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The University of Maryland has found chlordane dust in the litter to be fairly effective in controlling lice. The recommended method is to use one pound of 5% chlordane for each 80 feet of floor space. Careful observation of the manufacturer's recommendations for using chlordane is suggested.

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Infrared rays are being used successfully to brood chicks under extremely cold temperatures, according to Seeger, (*Poultry Trib.*, p. 7, Oct. 1950).

BOOK REVIEWS

Books reviewed in this department and any other books, if available, may be obtained by remitting the published price to the Book Department, Veterinary Medicine, Suite 803 Livestock Exchange Building, Kansas City 15, Missouri.

SWINE PRODUCTION, by *W. E. Carroll* and *J. L. Krider,* University of Illinois, Urbana. 498 pages, 65 illustrations. McGraw-Hill Book Company, Inc., New York City, publisher.—Price $5.00.

Swine production as a major or minor farm enterprise occupies an important place in the curriculum of most agricultural colleges. This new book is a comprehensive textbook prepared for use in these courses.

The text material deals with the establishment and operation of a hog production unit, with emphasis on those breeding, feeding, management and marketing factors which most affect profits.

Most producers are extremely price sensitive, particularly to hog selling prices. Unfortunately, these men seldom know their production costs. It should be recognized that variations in the cost of producing pork actually have greater influence on profits than the variations in the selling price of market pigs. Cost factors are under the control of the operator and these are given prominence in this volume.

Treatment of all material throughout the text is fundamental, *i.e.,* principles rather than specific problems are discussed. Supplementary aid for the study of various phases treated in the text include critical evaluations of late experiments, and bibliographies at the end of each chapter which provide excellent material for further reading.

Contents of the book are divided into four parts: Part 1—Organization, a Factor in the Cost of Production; Part 2—Establishing a Swine Enterprise as a factor in the Cost of Production; Part 3—Management, a Factor in the Cost of Producing Pork; and Part 4—Feed as a Factor in the Cost of Production.

In handling subjects under these sections, the authors hold discussions strictly to the point; practical swine husbandry as a profitable venture. Nothing having to do with the diseases of swine or their treatment is included. Nevertheless, the text is of interest to veterinarians for the information given on good management and nutrition that assuredly have influence on herd health.

GALLERY OF AMERICAN DOGS, text by *Harry Miller,* photographs by *A. S.* and *Katherine Mawhinney,* drawings by *Paul Brown.* 262 pages, 120 head studies, 120 pen-and-ink drawings. McGraw-Hill Book Company, Inc., New York City, publisher.—Price $7.50.

This is the most beautiful book about dogs this reviewer has ever seen. The reproductions of glamorous head studies appear opposite text material regarding the breed represented. These pictures, reproduced as full-page gravure, illustrate an outstanding breed specimen. They have won photographic honors here and abroad and represent years of painstaking work of dog portraiture. The animal's name and owner are given below each picture.

Text material is brief and authoritative. Facts of origin, background, history, physical appearance, use and qualities are given in interesting style for each of the 113 breeds recognized by the American Kennel Club, and seven other popular American breeds of dogs.

There is a pen-and-ink drawing of the entire animal by Paul Brown, of each breed, on the page facing the photograph. The detail in these presents outstanding features of various breed specimens. Illustrative technic is excellent.

Gallery of American Dogs will interest a wide range of readers. It is a source of information and will be prized by dog owners for this reason as well as for its illustrative beauty. No previous work covering such a large number of breeds of dogs serves as well to define a particular breed to those unfamiliar with the diversity of physical characteristics in the canine world.

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New Books for the Veterinarian's Bookshelf

Canine Surgery—Edited by J. V. Lacroix and H. Preston Hoskins (24 authors)	$12.00
Animal Nutrition—L. A. Maynard	5.00
Radiology in Small Animal Practice—Gerry B. Schnelle	8.00
Animal Sanitation and Disease Control—R. R. Dykstra	3.50
Williams' Surgical Operations—A. G. Danks	2.50
Planning Your Animal Hospital	3.50

CLINICAL REPORTS

Aureomycin in the Treatment of Strangles

HAROLD O. SHEETZ, D.V.M., Garden City, N. Y.

Five Thoroughbreds, five years of age, four mares and one gelding, from four different racing stables, were in pasture on a boarding farm for 60 to 90 days after training on the race track. One mare, which had arrived from Argentina six months previously, showed the first symptoms of a nasal discharge and a temperature of 105 F. During the subsequent two days, inactivity and depression were evident in three additional horses, and on examination, temperatures ranged from 103.6 F. to 104.2 F. Inappetence was general, and in one animal, weight loss and dehydration were evident. The submaxillary lymph nodes were greatly enlarged in two animals. A purulent nasal discharge was noted. A symptomatic diagnosis of strangles was made. A single dose of 1,000,000 units of procaine penicillin was administered intramuscularly. In addition, one horse received one dose of 240 gr. of sulfathiazole, orally.

By the following day, there was no apparent improvement. In fact, in some of these animals, symptoms had become exaggerated. Submaxillary nodes were involved in two. A bilateral nasal discharge was present in a third animal. At this time the fifth horse was showing symptoms. While there was no apparent gross change in the lymph nodes, a serious nasal discharge, difficult swallowing, and a deep cough developed. In one animal, the lymph nodes were incised on the following day.

Bacteriology

To check further the symptomatic diagnosis, bacteriological examination of nasal swabs from three horses, and the exudate obtained following incision, was carried out in a diagnostic laboratory. *Streptococcus equi* was isolated from all three. In addition, other organisms were isolated which were not considered to be pathogens. Blood cultures were negative.

Treatment

Aureomycin hydrochloride, buffered with sodium glycinate, was injected intravenously, with an initial dose of 5 mg. per lb. of body weight, and maintenance doses of 2.5 mg. per lb. were given at 12-hour intervals thereafter for a total of five doses in four animals and four doses in one. The initial dose of aureomycin was reconstituted in 250 cc. of distilled water to make a 2% solution, and the maintenance doses with 60 cc. of distilled water making 4% solutions.

Results

In all instances, there was a drop in temperature within 12 hours after the first dose of aureomycin. There was marked clinical improvement in three days, at which time temperatures were normal. Table 1 shows temperatures recorded one day previous to treatment and for three days afterwards. Enlarged nodes subsided promptly. Nasal discharge became scanty in three animals, but persisted for four days in one. Clinical recovery occurred within one week in four horses. In the fifth, a slight cough continued to the sixth day, but there was complete recovery in nine days. On examination 20 days after treatment, all horses were apparently normal, and there had been no recurrence of symptoms nor sequelae. Table 2 gives a summary of history and treatment.

Immediately following administration of the drug, there was slight diuresis. There was no evidence of toxicity at any time during the period of observation.

Comment

Few reports have appeared on the use of specific chemotherapeutic agents in strangles

TABLE 1. TEMPERATURE CHART

Horse No.	Date 6-29	(Aureo. Adm. Started) 6-30	7-1 a.m.	7-1 p.m.	7-2 a.m.	7-2 p.m.	7-3 a.m.	7-3 p.m.
1	103.8	103.2	99.2	103.2	100.0	100.0	99.0	100.2
2	103.6	102.4	99.8	102.4	100.2	101.2	99.0	100.0
3	104.2	102.2	100.4	103.4	100.4	101.8	99.3	100.8
4	104.0	102.0	101.4	104.0	99.8	102.4	100.2	100.6
5	.....	103.4	102.4	101.2	100.2	101.2	100.2	100.4

therapy. Roberts[1] reported "marked and rapid recovery" of one horse with strangles of 14 days' duration, following the parenteral administration of 1,700,000 units of penicillin over a period of 48 hours, plus a total of 204 gm. of sulfamerazine orally, t.i.d., over a period of eight days. The prompt recovery of six of ten horses treated was reported by Semtner[2] following the administration of penicillin in doses of 100,000 units every three to four hours, totaling five to nine doses. However, response to such treatments has been relatively unsatisfactory in my experience with Thoroughbred horses. Recovery has been slow, with accompanying dehydration, weight loss, and loss of condition, and the animals have been out of training for protracted periods.

The prompt clinical response following aureomycin therapy, with rapid reduction of temperature and remission of symptoms, coupled with low toxicity, indicates that this is a promising antibiotic for the racing stable. Freedom from complications which so often develop, and speed of action promptly checked the loss of condition usually accompanying the disease, and prevented its spread to other animals on the premises. Use of aureomycin in the treatment of other infectious diseases should be encouraged, taking a lead from its reported *in vitro* activity[3].

REFERENCES

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3. Kanegis, L. A., Kiser, J. S., Dornbush, A. C., Burkhart, R. L., Gadekar, S. M., deMello, G. C., and Pelcak, E. J., Aureomycin. *Vet. Med.*, 45:313 (Aug.), 1950.

TABLE 2. INTRAVENOUS ADMINISTRATION OF AUREOMYCIN HYDROCHLORIDE IN THE TREATMENT OF STRANGLES

			Previous treatment		Treatment-Aureomycin			Results			
Date	Symptoms*	Bacteriology	Procaine pen. Million units	Other	Initial mg./lb.	Maintenance 12 hr. interval mg./lb.	Total doses	Improvement Days	Clinical recovery Days	Recurrence	Other
6-29	Submaxillary nodes swollen Purulent nasal discharge	.....	1	240 gr. sulfathiazole	5	2.5	4	3	7		
6-29	Nodes greatly enlarged Slight nasal discharge	*Str. equi*	1	nodes incised	5	2.5	5	3	7	No recurrence 20 days	
6-29	Nodes markedly enlarged Purulent nasal discharge Wt. loss and dehydration	*Str. equi* *Staph. albus* Gram—rod	1	.....	5	2.5	5	3	7		Nasal discharge continued to drain 4 days
6-29	Slight cough	.....	1	.....	5	2.5	5	3	9		Cough continued to 6th day
6-30	Slight nasal discharge Difficult swallowing Deep cough	*Str. equi*	....	.....	5	2.5	5	3	7		

*Inactivity and elevated temperatures in all animals.

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In a preliminary report on continuing studies of the bacterial flora of the reproductive tract of cattle, Dr. G. T. Easley, Sulphur, Okla., and Mr. R. H. Leonard, Stillwater, Okla., cite evidence to correlate bacterial findings with conception and breeding history. It is interesting to note that the third fold of the cervix appears to be a barrier to microorganisms. Posterior to this point the bacterial flora resembles that of the vagina; anterior, that of the adjacent cavity.

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The most drastic fate that could befall mankind, aside from physical annihilation, is the turning of the clock back from the hour of freedom, and the forging anew of the chains of caste in the heat of chronic crisis. This is the true measure of the peril represented by the garrison-prison state, which has already emerged in the Soviet Union, and which it is the aim of sound policy to prevent in the United States and elsewhere on the globe.—*Prof. Harold D. Lasswell.*

VETERINARY ITEMS OF INTEREST

Though symptomless, cows infected with the organisms of Q fever (*Coxiella burnetii*) shed the Rickettsia in urine, feces and placenta.

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Chickens may be infected with brucellosis, and all nine strains of Brucella infection have been recovered from poultry carriers.

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It is foolhardy to depend altogether on newer principles of nutrition, forsaking those tried and proved methods and means developed through the years.

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Additions of fluoride to the water supply of the village of Newburgh, N. Y., during the last four years have resulted in a 32.5% reduction in tooth decay among school children.

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Foot-and-mouth disease is rare in man. Smallpox vaccine contaminated with foot-and-mouth disease virus did not infect children vaccinated with it though cattle were infected.

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From results of continuing research with lyophilized or dried form of *Brucella abortus* strain 19 vaccine, resistance of the vaccine to high temperatures is claimed. Experimentally this product has withstood temperatures up to 100 F. for six weeks without injury or significant reduction in antigenicity.

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It is possible to control and eradicate hog cholera, yet we allow this most destructive, acute, livestock disease to rampage and decimate herds. Present efforts only minimize losses; no program of elimination is in sight. Benefits to the veterinary profession as well as to swine growers are certain in direct proportion to the results in control of this dangerous, widespread swine disease.

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Regardless of the treatment used, animals recovered from anaplasmosis are carriers of the infection to susceptible animals. Evidence also points out that these remain carriers perhaps for their remaining lifetime. These animals are not subject to reinfection. In considering these facts and field experience of many practitioners, the percentage of carrier animals appears to have steadily increased during recent years.

A loss of one pint of blood per adult sheep per day is the estimated result of a fairly heavy wireworm (*Haemonchus contortus*) infection.

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The surgeon's ability to properly apply fracture reduction appliances, not the quality of those recently developed, limits their successful use.

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Antibiotics were known to a few workers as long as 50 years ago. At that time they were considered to be too toxic to be used as therapeutic agents.

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Hemoglobinuria may be due to leptospirosis, but symptoms of "red water" are not constant in all infected cases. Icterus may or may not accompany hemoglobinuria.

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In civil defense plans prepared in New Jersey, veterinary clinics and hospitals are designated as medical first-aid stations for periods of possible acute emergency.

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Though the pathogen may acquire public health significance, there are no present indications that bovine leptospirosis in the United States is important as a health hazard.

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In considering the possible cause of disease conditions in sheep, it is recommended first to eliminate parasites as the possible cause of the malady or their influence on it.

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Some of the newer insecticides, including the chlorinated hydrocarbons, are extremely toxic for fish. Dead fish in numbers have been observed in streams and lakes adjoining fields treated with these insecticides.—*R. D. Turk, D.V.M.*

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Record of performance (ROP) studies of beef cattle under range conditions have been carried on at the U. S. Range Livestock Experiment Station at Miles City, Mont., for 25 years. Rapidity of growth and good carcass quality are the criteria by which calves are judged in "proving" their sires.